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GOLD MEDAL PRIZE ESSAY.

Subject:—

"IN THE EXISTING STATE OF DEVELOPMENT OF WAR-SHIPS, AND OF TORPEDO AND SUBMARINE VESSELS, IN WHAT MANNER CAN THE STRATEGICAL OBJECTS, FORMERLY PURSUED BY MEANS OF BLOCKADING AN ENEMY IN HIS OWN PORTS, BE BEST ATTAINED?"

By Lieutenant A. C. DEWAR, R.N.

"*Wind and Fire.*"

Continued and concluded from April JOURNAL, p. 378.

SUMMARY OF CONTENTS.

IV.—Goes more fully into some aspects of Blockade Work.

V.—Treats of Position Strategy. This is the form of Strategy recommended, and consists in taking up a suitable Strategic Position. This sounds simple. But the Distribution of Forces and relative suitability of Different Positions require detailed consideration.

In order to show the Principles of Position Strategy applied to a particular case, a Strategic Scheme is delineated with France and Russia as supposititious opponents.

A full treatment of Position Strategy would consist of such schemes drawn up for various hostile combinations.

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LEADING 'IDEAS.

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BLOCKADE CONCLUSIONS.

Blockade Strategy is based on the fundamental assumption that *the enemy at the outbreak of war will adopt a passive attitude and remain in port.*

It is still important to obtain accurate news of the enemy as soon as possible, and in the last century this news could only be obtained by close observation of the enemy's ports. In modern warfare *the dangers of close observation are greatly increased,* while other and simpler methods of obtaining news only require to be properly organised. Information agents, neutral telegraph systems, and newspapers, all facilitate the location of an enemy's ships.

The disadvantages under which the blockaded squadron once used to labour no longer exist. The principal one was that the fleet blockaded had to lie stagnating in port, and could not put to sea without incurring the risk of having to beat slowly back into harbour, and be forced into action by the blockading fleet. It needed sea room. Nowadays it would be simple for a fleet blockaded in a first-class port to carry out target practice and battle manœuvres daily, and withdraw into the zone of land batteries and S.B.'s if the blockading fleet came up. The development of submarines has greatly *increased the danger of approaching within 20 miles of an enemy's port during the day.* It is an approved method of French tactics to throw out a line of S.B.'s, then put to sea and attempt to draw the blockading fleet into their sphere of action.

As steam has greatly increased the chance of a fleet escaping unobserved on a dark night, the blockading force, unable to actually reconnoitre a fortified port, will *always be uncertain whether the enemy is there,* and must rely on news from the nearest telegraphic base.

Finally, the advisability of a particular blockade depends on the following considerations:—

1. *Defences of port in question.*
2. *T.B. and S.B. forces of enemy.*
3. *Distances of hostile T.B. stations* from blockading centre.
4. *Distance of first-class coaling* and repairing base.
5. Time to receive Admiralty news.
6. *Ability to establish temporary base.*

If we compare Brest and Toulon in these respects, we find:—

TOULON.

1. Impregnable.
2. 53 T.B.'s 2 S.B.'s.
3. Porte de Vendres 140 miles 2 T.B.'s.
   Ajaccio 120 „ 8 T.B.'s, 2 S.B.'s.
   Algiers 315 „ 8 T.B.'s.
   Bona 290 „ 4 T.B.'s.
   Bizerta 320 „ 10 T.B.'s.
4. Malta 550 „
   Gibraltar 680 „
5. By despatch from Malta 22 hours.
   By wireless (250 miles) and despatch 13 hours.
6. Balearic Islands and Sardinia are the only ports available.

BREST.

1.	Impregnable.		
2.	40 T.B's.		
3.	L'Orient	160 miles	14 T.B.'s.
	Rochefort	290 „	16 T.B.'s 4 S.B.'s.
4.	Plymouth	170 „	
5.	By wireless chain from Falmouth, 1 hour.		
6.	None required.		

It will be seen *that the blockade conditions are quite dissimilar.* In the case of Brest, there is a first-class base for the blockading fleet within 170 miles; T.B. attack can only come from one direction; the weather is not usually favourable for T.B.'s and S.B.'s, and the latest central news should reach the Admiral in 1½ hours at most. *In the case of Toulon, the conditions are much more unfavourable.* Malta, which has no resources behind it, is 550 miles off the blockade centre; the line of communication is threatened by 4 T.B. stations, and passes Bizerta, a second-class base; the Mediterranean is favourable for T.B. work; the fleet is exposed to attacks from every direction, and news from Malta or Gibraltar has to cover nearly 600 miles. Accordingly, *a Brest blockade might be sound strategy, while the doubtful advantages of a Toulon blockade are not worth the risks involved.*

Fine-day manœuvre blockades tend to give one too favourable an idea of the capabilities of the blockading fleet. A large number of cruisers are usually available, whereas in actual war there would be a percentage of vessels coaling, a percentage of breakdowns, some on detached service and maintaining communications, and others convoying colliers.

The primary consideration is to bring the battle fleet into action superior in number to the enemy and in as perfect a condition as possible; the secondary consideration is to gain touch with the enemy, and we must not subordinate the primary consideration of action to that of observation. In an emergency we must take great risks; but we are not entitled to take such risks unless the matter is urgent. The opening moves of a campaign must not be risky, though the execution of details may be boldly carried out. It is ridiculous to expose one's fleet to such risks in observing an enemy's port as may seriously diminish its fighting force, and compel it to withdraw.

Generally speaking, then, Blockade Strategy, by which is *meant the blockade of the enemy's principal naval ports, is not advisable under modern conditions of naval warfare,* and is particularly dangerous and risky in the case of Toulon.

IV.

COALING.

Let P be a ship's blockade period or number of days, it can remain on blockade without coaling.

Let p be the time away or days occupied in passage to and fro.

Let n be the number of ships absent at one time, and N the number of ships in the fleet.

Then every ship must be sent away once in P days at least.

But $\frac{N}{n}$ will be the number of batches sent away.

$$\therefore \frac{N}{n} \times p = P$$

$$\therefore n = \frac{Np}{P}$$

but the last batch need not start till the last day—

$$\therefore n = \frac{Np}{P + p - 1}.$$

Plan 6.

BLOCKADE COALING EXAMPLES.

BREST.

EXAMPLE I.

Port Blockaded	Brest.
Number of Ships	7 Cæsars.
Coaling Base...	Plymouth.
Coal Reserve...	900 miles at 15 knots.
Time on Blockade	17·5 days.
Time away	3·1 „
Number away at a time	1·1.
Least number on Blockade	5.

BLOCKADE—COALING ROUTINE.

Day of Blockade.

Ships.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
a.	x	x	x																	x	x	x
b.				x	x	x																
c.							x	x	x													
d.										x	x	x										
e.													x	x	x							
f.															x	x	x					
g.																	x	x	x			
Number on Blockade ...	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	6	6			

DATA.

Coal Capacity	1,900 t.	Coal Reserve	625 t.
Distance from Base ...	170 m.	Time for Coaling	48 hrs.
Passage Speed	12 k.	Coal per day on Blockade	60 t.
Battle Coal...	80 t.		

BREST—contd.

EXAMPLE II.

Port Blockaded...	Brest
Number of Ships	12 Implacables.
Coaling Base	Plymouth.
Coal Reserve	900 miles at 15 knots.
Blockade Period	16·7 days.
Time away	3·2 ,,
Number away at a time ...	2
Least number on Blockade ...	10

BLOCKADE—COALING ROUTINE.

Day of Blockade.

Ships.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
a.	x	x	x																x	x	x
b.	x	x	x																x	x	x
c.				x	x	x															
d.				x	x	x															
e.							x	x	x												
f.							x	x	x												
g.										x	x	x									
h.										x	x	x									
j.													x	x	x						
k.													x	x	x						
l.																x	x	x			
m.																x	x	x			
Number on Blockade ...	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10			

DATA.

Coal Capacity	1,900 t.	Coal Reserve ...	680 t.
Distance from Base ...	170 m.	Time to Coal ...	48 hrs.
Passage Speed	12 k.	Coal per day on Blockade	60 t.
Battle Coal	80 t.		

TOULON.

EXAMPLE III.

Port Blockaded...	Toulon.
Number of Ships	12 Implacables.
Coaling Base	Malta.
Coal Reserve	900 miles at 15 knots.
Days on Blockade	10·5
Time away	5·8
Number away at a time ...	4·5
Least number on Blockade ...	5

BLOCKADE—COALING ROUTINE.

Day of Blockade.

Ships.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
a.	x	x	x	x	x	x															
b.	x	x	x	x	x	x															
c.	x	x	x	x	x	x															
d.	x	x	x	x	x	x															
e.	x	x	x	x	x	x															
f.					x	x	x	x	x	x											
g.					x	x	x	x	x	x											
h.										x	x	x	x	x	x						
j.										x	x	x	x	x	x						
k.										x	x	x	x	x	x						
l.										x	x	x	x	x	x						
m.										x	x	x	x	x	x						
Number on Blockade ...	7	7	7	7	5	5	10	10	10	5	7	7	7	7	7						

DATA.

Coal Capacity	1,900 t.	Coal Reserve ...	680 t.
Distance from Base ...	550 m.	Time to Coal	48 hrs.
Passage Speed	12 k.	Coal per day on Blockade	65 t.
Battle Coal	80 t.		

TOULON—contd.

EXAMPLE IV.

Port Blockaded...	Toulon.
Number of Ships	12 Implacables.
Coaling Base	Pollenza Bay.
Coal Reserve	900 miles at 15 knots.
Blockade Period	15·5 days.
Time away	3·1 ,,
Number away at a time ...	2.
Least number on Blockade ...	10

Blockade—Coaling Routine.

Day of Blockade.

Ships.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
a.	x	x	x																		
b.	x	x	x																		
c.				x	x	x															
d.				x	x	x															
e.							x	x	x												
f.							x	x	x												
g.										x	x	x									
h.										x	x	x									
j.													x	x	x						
k.													x	x	x						
l.																x	x	x			
m.																x	x	x			
Number on Blockade ...	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10			

Data.

Coal Capacity	1,900 t.	Coal Reserve ...	680 t.
Distance to Base ...	154 m.	Time Coaling ...	48 hrs.
Passage Speed	12 k.	Coal per day on Blockade	60 t.
Battle Coal	80 t.		

TOULON—contd.

EXAMPLE V.

Port Blockaded...	Toulon.	
Number of Ships	Watch Squadron 2aC, $2C_2$.	
Coaling Base	Malta.	
Coal Reserve	800 miles at 20 knots.	
	aC	C_2.
Time on Watch...	8·5 days	7·5
Time away	6·1	6·1
Number away at a time ...	1	1
Least number on Watch ...	1	1

WATCH—COALING ROUTINE.

Day of Blockade.

Ships.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
aC.																x	x	x	x	x	x
a.		x	x	x	x	x	x														
b.									x	x	x	x	x	x							
Number on Blockade ...	2	1	1	1	1	1	1	2	1	1	1	1	1	1	2	1	1	1	1	1	1
C_2.																					
c.		x	x	x	x	x	x									x	x	x	x	x	x
d.								x	x	x	x	x	x								
Number on Blockade ...	2	1	1	1	1	1	1	2	1	1	1	1	1	2	2	1	1	1	1	1	1

DATA.

	aC.	C_2.		aC.	C_2.
Coal Capacity ...	2,200	1,100	Coal Reserve ...	900 t.	370 t.
Distance to Base	600 m.		Time to Coal ...	48 hrs.	
Passage Speed ...	12 k.		Tons per day ...	84 t.	48 t.
Battle Coal ...	80 t.	40 t.			

TOULON—contd.

EXAMPLE VI.

Port Watched	Toulon.
Number of Ships	2aC, $2C_2$.
Coaling Base	Pollenza Bay.
Coal Reserve	800 miles at 20 knots.
Time on Watch	12·1 days.
Time away	3·4 „
Number away at a time ...	1
Least number on Blockade ...	3

WATCH—COALING ROUTINE.

Day of Blockade.

Ships.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
aC.																								
a.				x	x	x													x	x	x			
b.							x	x	x													x	x	x
On Watch	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1			
C_2.																								
c.										x	x	x												
d.													x	x	x									
On Watch	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	

DATA.

	aC.	C_2.			
Coal Capacity ...	2,200 t.	1,100 t.	Coal Reserve ...	900 t.	— 370 t.
Distance from Base ...	200 m.		Time Coaling	48 hrs.	
Passage Speed	12 k.		Tons per day ...	84 t.	48 t.
Battle Coal ...	80 t.	40 t.			

SCAW.

EXAMPLE VII.

Channel Blockaded	Scaw.
Ships on Blockade	3 Albions, 6 R. Sovs.
Coaling Base	Dover.
Coal Reserve	800 miles at 15 knots.

	Albion.	R. Sov.
Days on Blockade	20·8	15·1
Days away Coaling	5·7	5·7
Number away at a time	1	2
Least number on Blockade	2	4

BLOCKADE—COALING ROUTINE.

Day of Blockade.

Ships.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Albion																									
a.								x	x	x	x	x	x												
b.														x	x	x	x	x	x						
c.																				x	x	x	x	x	x
R. Sov.																									
d.			x	x	x	x	x	x																x	x
e.			x	x	x	x	x	x																x	x
f.									x	x	x	x	x	x											
g.									x	x	x	x	x	x											
h.															x	x	x	x	x	x					
j.															x	x	x	x	x	x					
On Blockade																									
Albion.	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	9	2	2	
R. Sov.	6	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	6	6	6	4	

DATA.

	Albion.	R.S.
Coal Capacity ...	1,700 t.	1,400 t.
Distance from Base ...	170 m.	
Passage Speed	12 k.	
Battle Coal	48 t.	

	Albion.	R.S.
Coal Reserve	415 t.	460 t.
Time Coaling ...	48 hrs.	
Tons per day ...	44 t.	46 t.

The arguments required are:—

a = Coal Capacity.
b. Distance of coaling base.
c. Passage speed.
d. Tons per hour at passage speed.
e. Coal for 6 hours at full speed (battle coal).
f. Coal limit.
h. Hours to coal, clean up, take in stores, etc.
k. Speeds on blockade.
m. Tons per day at blockade speeds.
n. No. of ships absent at a time.

$$n = \frac{Np}{P + p - 1}$$

But *days away* = Days on Passage + Days at base.

$$\therefore p = \frac{2b}{24c} + \frac{h}{24}$$

$$\textit{And Blockade Period} = \frac{\text{Blockade Coal}}{\text{Consumption per day.}}$$

$$= \frac{\text{Coal Capacity} - (\text{Coal on Passage} + \text{Battle Coal} + \text{Limit})}{\text{Cons. per day on blockade.}}$$

$$\therefore P = \frac{a - \left(\frac{2bd}{c} + e + f\right)}{m}$$

EXAMPLE 1.

TOULON.

Let Toulon be port blockaded, ships of "Implacable" class, Malta the coaling base, 10 number of blockading fleet.

Then
a = 1,900 tons.
b. 550 miles.
c. 12 knots.
d. 5 tons.
e. 80 tons.
f. 100 tons.
h. 48 hours.
k. 5 for 10 hours, 12 for 4 hours, 10 for 10 hours.
m. 85 tons.

$$n = \frac{10\,p}{P + p - 1}$$

$$p = \frac{2 \times 550}{24 \times 12} + \frac{48}{24} = 3{\cdot}81 + 2 = 5{\cdot}8 = 6.$$

$$P = \frac{1900 - \left(\frac{2 \times 550 \times 5}{12} + 80 + 100\right)}{85} = 14{\cdot}85.$$

$$N = \frac{10 \times 6}{14{\cdot}8 + 6 - 1} = \frac{60}{19{\cdot}8} = 3{\cdot}04.$$

$\therefore$ No of batches in one Blockade Period $= \frac{\Lambda}{n} = 3{\cdot}3$, but n and No. of batches must be integral.

$\therefore$ *Batches = 2 of 3 ships and 1 of 4 ships.*

Least number on Blockade = 6.

(See also Blockade Examples in Plans.)

EXAMPLE 2.

BREST.

Let 12 be the No. of ships of "Implacable" class, Brest the blockaded port, Plymouth the coaling base.

$a.$ = 1,900 tons.
$b.$ = 170 miles.
$c.$ = 12 knots.
$d.$ = 5 tons.
$e.$ = 80 tons.
$f.$ = 100 tons.
$h.$ = 48 hours.
k = 5 for 20 hours, 12 for 4 hours.
m = 60.

$$n = \frac{12\,p}{P+p-1}$$

$$p = \frac{2 \times 170}{24 \times 12} + 2 = 3{\cdot}18$$

$$P = \frac{1900 - \left(\frac{2 \times 170 \times 5}{12} + 80 + 100\right)}{60} = 26{\cdot}68$$

$$n = \frac{12 \times 3}{26 + 3 - 1} = 1{\cdot}28$$

No. away at a time = 1 or 2.

Batches in blockade period of 26 days = 10 of 1 and 1 of 2.

Least number on blockade = 10.

EXAMPLE 3.

BREST (*Special*).

Let Brest be the port, 12 be No. of ships, Plymouth the coaling base. Sufficient coal is always to be ready to go from Brest to Gibraltar, 930 miles, at 15 knots.

From Brest to Gibraltar at 15k. $= \frac{930}{15} \times 12 = 744.$

$a.$ = 1,900 tons.
$b.$ = 170 miles.
$c.$ = 12 knots.
$d.$ = 5 tons.
$e.$ = 80 tons.

f = 744 tons.
h = 48 hours.
k = 5 for 20, 12 for 4.
m = 60.

$$n = \frac{Np}{P + p - 1}$$

$$p = \frac{2 \times 170}{24 \times 12} + 2 = 3{\cdot}18$$

$$P = \frac{1900 - \left(\frac{2 \times 170 \times 5}{12} + 80 + 744\right)}{60} = 15{\cdot}5$$

$$n = \frac{12 \times 3}{15{\cdot}5 + 3 - 1} = 2{\cdot}06.$$

No. of batches = 5·8.

∴ Batches will be 6 of 2 ships.

Least number on blockade = 10.

EXAMPLE 4.

Scaw and Cattegat.

Let the Scaw be Channel blockaded, let there be 3 ships of 1,700 tons capacity ("Canopus," "Albion," "Renown") and 6 ships of 1,400 tons ("Royal Sovereign" class). Let Dover be coaling base.

Consider 3 ships of 1,700 tons.

a = 1,700
b = 540
c = 12
d = 3·6
e = 48
f = 100
h = 48
k = 5 for 20, 12 for 4
m = 44
p = 5·75, P = 27
n = ·55
∴ Batches = 6
Batches are 3 of 0, 3 of 1.

Consider ships of 1,400 tons.

a = 1,400
b = 540
c = 12
d = 2·1
e = 60
f = 100
h = 48
k = 5 for 20,12 for 4
m = 46
p = 5·75, P = 23
n = 1·28
∴ Batches = 4·6
Batches are 4 of 1, and 1 2 ships.

Note.—b is distance of battle fleet position to coaling base; k includes 4 hours' manœuvring daily at 12 knots.

SECONDARY BASE.

A secondary base is very necessary to a blockading force for the purpose of

a. Coaling.
b. Shelter to small craft.

The requirements of a secondary base are:—

1. *Within daylight hours of the battle fleet* position at 10 knots, viz., 120 miles.
2. *Sheltered anchorage.*
3. *Capable of extempore defence against T.B. attack.*
4. Isolated, in order that movements of fleet may be as secret as possible.

The best examples of such bases are:—

Mytilene Lemnos	For blockade of Dardanelles.
Port Mahon	„ Toulon.
Navarino Suda Bay Marmorice	For operations in the Levant.

Lemnos 45, and Mytilene 70 miles from the Dardanelles, two islands in the N. Ægean; both possess good harbours, capable of holding the largest fleets.

The entrance of Port Mudros, the principal harbour in Lemnos, is rather too wide (4,000 yards across) for extempore defence against T.B. attack.

Mytilene contains two large harbours, Jero and Kalloni, absolutely landlocked, 7 to 10 fathoms deep, with long narrow entrances not more than 500 yards wide. Port Jero is entered by a narrow channel, $3\frac{1}{2}$ miles long, and, in some places, not more than 200 yards wide. The average width of the entrance is 400 yards; the harbour is 5 miles long, 3 miles wide, and 10 fathoms deep. Port Kalloni is entered by a very narrow channel $\frac{1}{2}$ mile long, 80 yards wide, and 17 fathoms deep; it is particularly deadly to T.B.'s, as the whole of the entrance, except the channel, is blocked by a mudflat, covered by $1\frac{1}{2}$ feet of water; the entrance, though of ample depth, is almost too narrow for ordinary use, and would require to be carefully buoyed.

Suda Bay, in Crete, is capable of defence against T.B. attack; the principal entrance channel is 1,600 yards wide; the other is only 200 yards wide, and is blocked by a shoal and rocks.

This harbour is a strategical centre of

Dardanelles, 300′.
Malta, 500′.
Egypt, 400′.

But is exposed to heavy gales in winter.

Navarino is a large harbour in the S.W. corner of Greece, easily protected, and occupying a strong strategic position between Malta and the Dardanelles; the entrance is 1,400 yards wide; the harbour is $2\frac{3}{4}$ miles by 2 miles wide, and 23 fathoms deep.

Marmorice is a large and easily protected harbour, with a strong position, between the Dardanelles and Alexandria; an island lies in the middle of the entrance, with a channel on one side 1,100 yards wide, narrowing to 800; on the other side 500 yards wide; the harbour is $2\frac{1}{2}$ miles long by $3\frac{1}{4}$ wide. All these harbours have good holding ground.

Extempore Defence of Secondary Base.

It would be very necessary to protect a secondary base against T.B. attack, and every ship ought to be able to quickly set up one search-

light and two 12-pounders, efficiently mounted, on any suitable site. Not enough attention is given to this matter; or, if it is given, *it does not take a practical shape.* The defence of a harbour against T.B. attack is an important matter, and ought to be thoroughly done, particularly in the Mediterranean waters, which are admirably adapted to torpedo warfare. Every ship ought to carry materials for quickly building an extempore stationary mounting for 12-pounder guns; unless such gear is designed and tried in peace, it will not be ready in war. *At present 12-pounder guns are occasionally landed, but on clumsy field mountings, trained by a handspike, and quite useless* for rapid firing against T.B.'s going 700 yards a minute. In the case of search-lights, it is important to have these lights ashore, as they betray the position of the ship on board. They should be set up in favourable positions, perhaps some miles from the ship itself. In the case of the above-mentioned examples of secondary bases, the average distance would be about 2 miles, and in the case of Suda Bay about 3½ miles. At present, however, *they can only be burnt from the ships to which they are practically chained by the half-mile length of cable,* supplied for this purpose. The disadvantages are obvious; the cable is not long enough to reach to the harbour entrance, possibly some two miles off, and the loss of voltage in a half-mile length is often sufficient to make the light burn very poorly. *This could be easily overcome by arranging for steamboats to carry, when necessary, a small turbine dynamo,* to be worked off the boiler. The engine would be of Parsons' Motor "Barker Wills" type, the dynamo a turbine generator, 100 amperes, 80 volts, steam pressure 100 lbs. These dynamos are very small, *the total weight of dynamo and turbine being about* 3½ *cwt.* The search-light could be set up at the harbour entrance, on a suitable site, relative to the 12-pounder battery; the steamboat, armed, could anchor off the beach. A 100-yard length of cable (pattern 1,100, weight 3·3 cwt.) would be run ashore, and steam put on the dynamo. *Each ship could thus burn 2 lights in any position with a very small amount of trouble.* The suggestion is occasionally made, but no one takes the trouble to get the details definitely shaped; the necessity of something of this sort is obvious, and the fact is indisputable that our present appliances of 8 cwt. 12-pounder guns on field mountings, and search-lights chained to the ship, *are slipshod, and do not fulfil war requirements.* If the designs and material cut to shape were ready, a satisfactory fixed mounting could be very quickly set up, and any harbour with an entrance not more than 1,500 yards wide could be rendered safe against T.B. attack by 2 or 3 battle-ships.

ANTI-T.B. FIRE.

Under this heading we will consider the anti-torpedo armament of a large vessel, and its capacity to resist T.B. attack. This is a side issue of Blockade Strategy, because a blockading fleet will be particularly liable to torpedo attack, and *the danger of torpedo-boats will often exercise a potent influence in shaping a strategical plan.* At night, firing at a target (20 feet long by 7½ feet high) with small Q.F. guns, the number of hits is seldom more than 3 per cent; on one occasion, when the shooting was average, there were 128 shots fired by all 12-pounder guns, and 6 hits on the target. On another occasion there were 4 hits; this is at a stationary target, *after the whole armament of sixteen 12-pounders* have been firing at an average distance of

800 yards. In an actual attack, the target would be moving 20 knots, the maximum *number of 12-pounder guns firing would be 8, and the* distance from 2,000 to 800 yards. If a good watch is being kept, a T.B. may be sighted 2,000 yards (1 mile) off on an average night.

From 2,000 yards the change of distance and the period under fire is as follows:—

Speed of battle-ship, 12 knots.
Torpedo range at night, 600 yards.
a = Change of distance per min. in yards.
b = Gun-fire period.

Table 12.

Bearing of T.B.	Speed 18 knots.		Speed 20 knots.		Speed 22 knots.	
	a.	*b.*	*a.*	*b.*	*a.*	*b.*
Ahead	1,000	1m. 24s.	1,066	1m. 18s.	1,133	1m. 13s.
2 points on Bow	960	1m. 27s.	1,040	1m. 20s.	1,100	1m. 18s.
4 points on Bow	925	1m. 31s.	980	1m. 28s.	1,050	1m. 19s.
6 points on Bow	850	1m. 38s.	900	1m. 33s.	950	1m. 28s.
Abeam	720	1m. 56s.	795	1m. 45s.	835	1m. 34s.

It will be seen that 2 minutes is too great an estimate for *the under gun-fire period, which is nearer one minute than two.*

Consider, now, the anti-T.B. guns of a modern vessel.

These may be divided into:—

Boat-stopping shot—6-inch, 12-pounder, 3-pounder.
Man-killing shot—3-pounder, 1-pounder, Pom-pom, Maxim.

One 6-inch shell will sink a boat.

One 12-pounder shell bursting in fore compartment will blow a hole in the boat and disable her.

A 3-pounder shell may cut a steam pipe or disable the steering gear, but cannot be depended on to stop a boat.

Apart from any actual damage done, a heavy fire will disconcert the T.B. crew, and tend to hurry and inaccuracy.

The anti-T.B. guns, or guns which can be used against T.B.'s carried by modern vessels are:—

Table 13.

Gun.	Size.	Projectile.	Rounds per min.
		lbs.	
16-cm.	6·4-inch.	100	3
6-inch		100	4
14-cm.	5·5-inch.	66	5
4·7-inch		45	5
10-cm.	3·9-inch.	31	6
9-cm.	3·5-inch.	17½	6
14-pounder	3-inch.	14	6
12-pounder	3·4-inch.	12	6
6-pounder	2·2-inch.	6	10
3-pounder	1·8-inch (47-mm.)	3	10
1-pounder, revolver ...	1·4-inch (37-mm.)	1	50
1-pounder, automatic ...	1·4-inch pom-pom.	1	100

The anti-T.B. armament carried by the latest battle-ships of different nations at sea, or nearly complete, is as follows:—

England.	France.	Russia.	United States.
(Twelve 6-inch.) Sixteen 12-pdrs. Six 3-pdrs.	(Ten 6·4-inch.) Eight 3·9-inch. Thirty 3-pdrs.	(Twelve 6-inch.) Twenty 12-pdrs. Twenty 3-pdrs. Eight 1-pdrs.	(Twelve 6-inch.) Twelve 14-pdrs. Twelve 3-pdrs. Four 1-pdrs. Four 1-pdrs., automatic.
No. of shots per minute on one broadside } 102	139	378	420

Guns above 4-inch cannot be correctly described as anti-T.B. guns, but it would be a mistake not to use them. Every possible gun should be brought to bear. The 6-inch guns of one broadside can emit 36 shells in a fire period of 1½ minutes, and one of these hitting a T.B. would sink her.

The points to be attended to are:—

1. See all ready before sunset.
2. W.T.D.'s all properly closed.
3. No lights showing outside the ship.
4. Picked shots by the guns.
5. Good fire system.

W.T.D.'s are usually not thought of. Point 4 is absolutely neglected. When the watch mans and arms ship, captains of parts tell off hands to their guns, *quite irrespective of their marksmanship*. At some of the guns you will find an ordinary seaman and a boy, whose knowledge of the gun is practically *nil*. *The point that officers fail to grasp is the shortness of the fire period.* The men who are lying at the guns will be the only ones to take part in the attack; *in a fire period of one minute there is no time for hands to man and arm ship*, for the commander to be called, etc. The safety of the ship will lie in *one heavy burst of firing*.

Nets are not much good at sea when the ship is moving, and in modern battle-ships the lower booms have to be got out first in order to haul the torpedo booms clear of the ship's side, which is clumsy, to say the least of it. With everything ready on an evolution morning in harbour, nets are got out in about 2½ minutes. At 1 a.m. at sea, to clear away the nets, get the lower booms out and haul forward would take nearly 15 minutes, and if the ship cruises with nets out, all the advantage to be gained from speed is lost. The use of nets is limited to harbour; general opinion is against their use at sea.

A good and simple fire system is a very important adjunct of T.B. defence. The time is so short and the distance changes so rapidly that it would be impracticable to pass the range and alter the sights.

The "Same distance" method of fire control is possible. Sights of all guns are set at the same commencing distance, say 1,000 yards; the general fire effect is noted by a competent observer; fire is stopped by bugle for a few seconds; the order is passed to raise or lower, and fire commenced again.

This method, however, is not altogether suitable for anti-T.B. fire at night, because:—

1. *Every second is valuable.* While stopping the fire and passing the word several seconds run out.
2. *Time is too short* and the pressure too great to raise or lower the sights amounts as specified by order.

Method Proposed.

The method proposed may be designated as *fire zoning*, and consists in *keeping a zone in front of the boat swept by fire*, through which the boat must pass. As many guns as possible *are equally distributed over the overlapping dangerous spaces of the fire zone.* The method is based on two assumptions:—

a. Guns should be set at different distances.

b. Sights can only be altered once. Thus fire is commenced with a certain distance (*commencing distance*) on the sight, and after that jammed down to a second pre-arranged distance (*final distance*).

The arrangement of the anti-torpedo armament requires consideration. At present our boat decks and shelter decks upon the bridges, which are the ideal position for anti-torpedo guns, are blocked up, and *their view obscured by boats and peace bridge stanchions.* Enormous boats are carried, which effectually prevent vision signals between the conning towers and casemate hoods. The conning tower is not only useless for conning the ship, but is covered with a heavy bridge and houses, which would come down over it like a candle extinguisher. These matters may be seen far afield from strategy; but great weights may hang on small wires. T.B. smashing is *an important matter in Blockade Strategy*, and it is dependent to a great extent on the position of the anti-torpedo guns. The first requisite is that the field of view should be as open as possible. Anti-T.B. guns should not be placed in ports. The 12-pounder guns on the main deck never made good night shooting. A suitable armament would be:—

Guns.	Number.
12-pounder	16
3-pounder	10
1-pounder (automatic)	10

Arranged as follows:—

Anti-T.B. Guns. *Table 14.*

Position.	12-pounder.	3-pounder.	1-pounder.
Fore Shelter Deck	2	2	2
Boat Deck	4	4	2
Upper Deck	8	—	—
After Shelter Deck	2	2	2
Fore Top	—	1	2
Main Top	—	1	2

NUMBER ON A BROADSIDE.

No.	Guns.	Shots per minute.
6	6-inch	24
8	12-pounder	48
6	3-pounder	60
5	1-pounder (auto)	500
		Shots per minute 632

The 1-pounder automatic is a useful gun, as when the fire period is very short everything depends on compressing as much fire into the time as possible. Weight and number must be combined; and the *disconcerting effect alone of five 1-pounders firing 100 rounds per minute would be very valuable.*

V.

POSITION STRATEGY.

Position Strategy consists in taking up a strategic position fulfilling as nearly as possible the following conditions:—

1. Commanding the probable route of the enemy.
2. Not too close to hostile T.B. stations; say 200 miles off.
3. Within wireless chain distance of a trustworthy telegraph; say 200 miles.

The ordinary position of the Battle Fleet would be termed central position (C.P.). *Course lines, with secondary R.V. at every 60 miles, should radiate from the central position,* countering the principal courses the enemy may take. These rendezvous course lines are very essential in order that cruisers and detached vessels may rejoin the fleet as soon as possible.

VARIOUS POSITIONS.

The position to be selected depends primarily upon:—

a. Distribution and number of hostile force.
b. Enemy's objective.

The following positions of strategic value may be instanced:—

North Sea.

A.—120 miles E. of Flamborough Head covers the E. Coast.

To Wash	140
„ Thames	175
„ Scaw	330
„ Elbe	190

Conditions.—Force expected from North Sea or E. coast.

Addendum.—Armoured cruisers and destroyers patrolling the coast.

Channel Entrance.

B.—65 miles W. of Scilly { 50° N. / 12° W. flanks Channel and covers Ireland.

To Bantry	120
„ Brest	165
„ Milford	150

C.—{ Lat. 49° N. commands Channel Entrance.
{ Long. 7° 30′ W.

To Scilly	70
„ Plymouth	155
„ Brest	120

D.—{ Lat. 49° N. commands Trade Route and Entrance.
{ Long. 10° W.

To Scilly	155
„ Brest	220
„ Finisterre	368
Brest to Finisterre	395

Conditions.—Force expected from Atlantic, or opposed to Brest Fleet.

Atlantic.

E.—{ Lat. 45° N. 80′ North of C. Ortegal, in Bay of Biscay.
{ Long. 8° W.

To Scilly	300
„ Brest	242
„ Finisterre	140
„ St. Vincent	495

F.—{ Lat. 43° N. 120′ W. of Finisterre.
{ Long. 120° W.

To Scilly	475
„ Plymouth	560
„ Brest	450
„ St. Vincent	390
„ Gibraltar	580

Conditions. — Force in Atlantic coming E., but doubtful whether making for Channel or Gibraltar.

G.—40′ S. of Cape St. Vincent.

To Gibraltar	175
„ Lisbon	140
„ Cadiz	130

Commands Channel to Gibraltar route.

H.—60′ W. of Gibraltar commands the Straits.

Mediterranean.

K.—85′ S. of Port Mahon is strategic centre of Gibraltar, Toulon, Malta.

To Gibraltar	500
„ Toulon	285
„ Malta	510
„ Algiers	125
„ Ajaccio	280
„ Bizerta	270
„ Bougie	120

Conditions.—Doubtful whether Toulon Fleet will go E. or W. This position has the following disadvantages:—

1. Distance to base is great, viz.: 500 miles.
2. Communication line is flanked by hostile T.B. stations.
3. T.B. danger in West Mediterranean.

L.—{36° N. 32′ S.W. of Matapan commands the Ægean
{22° E. [approach.

To Malta	365′
„ Malea	62′
„ Suda	115′
„ Navarino	56′

M.—{33½° N. commands approach to Egypt.
{27° E.

To Malta	645
„ Alexandria	200
„ Suda	215

COUNTER STRATEGY.

The counter strategy to any hostile Power is dependent to a great extent on a detailed knowledge of their force distribution.

The number of cruisers available for trade attack would be limited, unless the enemy intend to adopt a passive policy, and trade route protection will probably hinge on the correct location of three or four cruisers. A possibly defective point in our war system is a lack of organised information agents. Such agents should be stationed at:

a. *Shipping centres.*
b. *Headlands and straits.*
c. *Possible coaling harbours, e.g.*, Marmorice, Suda, etc.

The necessary points in the Mediterranean are:—

a.	*b.*
Shipping Centres.	*Headlands.*
Barcelona.	Ceuta.
Cartagena.	Bonifacio.
Palma.	Cape Spartivento.
Port Mahon.	„ Parsaro
Genoa.	„ Matapan.
Leghorn.	„ Malea.
Naples.	Euripo (in Eubœa).
Messina.	Chanak
Fiume.	Dardanelles.
Petras.	Gallipoli.
Athens.	
Syra.	*c.*
Constantinople.	*Coaling Harbours.*
Smyrna.	Tangier.
	Navarino.
	Suda Bay.
	Marmorice.

Every effort should be made to let British and neutral ship captains know that important information will be well paid for, if despatched in

time to be of use; and leaflets in all languages should be quietly distributed round ship captains, giving information as to quickest method of telegraphic despatch. Everything should be clear and definite; scales, etc., should be drawn up, *e.g.*:—

On receipt of news—Cost of telegram and £5.
When corroborated—£15.
Enemy's Fleet—£20.
Important results—£100 to £500.

A strategic scheme must be based on number. If we do not assume the existence of any particular hostile force we merely wander aimlessly about in generalities, and cannot descend into particulars where facts are certain and discussion more fruitful. Accordingly we will assume France and Russia to be the hostile Powers in question, and sketch a strategic (position) scheme for a Franco-Russian war.

A strategic scheme can be divided into—

a. Force list.
b. Distribution list.
c. Strategic moves.

STRATEGIC SCHEME.—ANTI-FRANCO-RUSSIAN WAR.

(*a*). FORCE LIST.

The Force List consists of a list of forces built and building (to be completed within 2 years) on either side.

ABBREVIATED NOTATION.

B_1=Battle-ship 1st class.	C_3=Cruiser 3rd class.
B_2 „ 2nd „	T.G. Torpedo Gunboat.
B_3 „ 3rd „	D Destroyer.
aC Armoured Cruiser.	T.B. Torpedo-boat.
C_1 Cruiser 1st class.	S.B. Submarine boat.
C_2 „ 2nd „	

TOTAL FORCES AVAILABLE.

GENERAL SUMMARY.

December, 1903. *Table 15.*

	B_1	B_2	B_3	aC	C_1	C_2	C_3	TGB	D	TB	SB
England	30	10	7	25	21	50	22	25	111	77	5
France	11	6	13	15	2	22	19	15	23	185	26
Russia	9	9	6	7	7	3	0	9	46	82	0
France-Russia	20	15	19	22	9	25	19	24	69	267	26
December, 1904.											
England	33	10	7	29	21	52	22	25	124	83	9
France	11	6	13	19	2	22	19	15	30	201	37
Russia	12	9	6	7	7	3	0	9	52	90	—
France-Russia	23	15	19	23	9	25	19	24	82	291	37
*December, 1905.**											
England	34	10	7	30	21	52	22	25	145	83	19
France	13	6	13	19	2	22	19	15	30	261	55
Russia	13	9	7	7	9	5	0	9	56	100	—
France-Russia	26	15	20	26	11	27	19	24	86	361	55

* See page 482.

ENGLAND.

Forces Available.

Name List. *Table 16a.*

B_1.	30.	B_2.	10.	B_3.	7.	aC.	25.
Duncan	6	Royal Sovereign	8	Sans Pareil.	1	County	6
London	3	Nile	2	Admiral	6	Berwick	—
Formidable	3					Donegal	—
Majestic	9					Essex	—
Canopus	6					Kent	—
Renown	1					Bedford	—
Barfleur	2					Monmouth	—
						Drake	4
						Cressy	6
						b.	
						Aurora	7
						Impérieuse	2

C_1.	21.	C_2.	50.	C_3.	22.
Spartiate	4	Arrogant	4	Pallas	4
Andromeda	4	Hermes	3	Barham	2
Powerful	2	Diana	8	Medea	2
Crescent	9	Astræa	8	Magicienne	3
Blake	2	Æolus	21	Pandora	11
		Forth	4		
		Mercury	2		

T.G.	30.	D.	111.	T.B.	77.	S.B.	5.
Harrier	5	'95	45	Nos.	21-101		
Alarm	11	'96	17				
Plassy	14	'97	18				
		'98	10				
		'99	5				
		'00	10				
		'01	2				
		'02	4				

FRANCE.

Forces Available.

Name List. *Table 16b.*

B_1	11	aC.	15	C_1.	2
Suffren	- 1	Gloire	- 5	d'Entrecasteaux	- 1
Iéna	- 1	Dupleix	- 3	Tage	- 1
Bouvet	- 1	Jeanne d'Arc	- 1		
Masséna	- 1				
Jauréguiberry	- 1	b.			
Carnot	- 1	Pothuau	- 1		
Charles Martel	- 1	Bruix	- 4		
Brennus	- 1	Dupuy de Lôme	- 1		
Gaulois	- 3				

FRANCE—*contd.*

FORCES AVAILABLE.

Name List.

C_2. 22	C_3. 19	
Guichen - 2	Lavoisier - 3	T.G. 7
Jurien - 1	Cosmao - 6	D. - - 23
Protet - 2	d'Estrées - 2	T.B. - - 185
Cassard - 8	Milan - 2	S.B. - - 26
Isly - 2	Condor - 6	
Descartes - 2		
Cécille - 1		
Alger - 1		
Sfax - 1		
Suchet - 2		

RUSSIA.

FORCES AVAILABLE.

Name List.

Table 16c.

B_1. 9	B_2. 9	B_3. 6
Potemkin - 1	Rostislav - 1	Nikolai - 2
Tsarevitch - 1	Sissoi-Veliky - 1	Apraksin - 3
Retvisan - 1	Tri Sviatitelia - 1	Peter Veliky - 1
Peresviet - 3	G. Pobiedonosets - 1	
Sevastopol - 3	Navarin - 1	
	Dvienad. Apost. - 1	
	Ekaterina - 3	

aC. 7	C_1. 7	C_2. 3
Bayan - 1	Varyag - 1	Svietlana - 1
Gromovoi - 1	Bogatyr - 1	Boyarin - 2
Rossia - 2	Diana - 3	
b.	Askold - 1	
Azova - 1	Korniloff - 1	
Nakhimoff - 1		
Dmitri Donskoi - 1		

T.G. - - 9	D - - - 46	T.B. - - - 82

FORCES BUILDING COMPLETED BY DECEMBER, 1905.

ENGLAND.

Table 17.

B_1. 4	aC. 5	C_2. 2
Albemarle in '04	Suffolk in '04	Encounter in '04
P. of Wales ,, '04	Cornwall ,, '04	Challenger ,, '04
Queen ,, '04	Cumberland ,, '04	
K. Edward VII. ,, '05	Lancashire ,, '04	
	Devonshire ,, '05	

D. 34	T.B. 6	S.B. 14
13 in - -'04	6 in - -'04	4 in - -'04
21 ,, - -'05		10 ,, - -'05

FRANCE.

B_1. 1	aC. 4	—
République in - '05	Léon Gambetta in '04	
	Condé ,, '04	
	Dupetit Thouars ,, '04	
	Amiral Aube ,, '04	

D 7	TB. 76	SB. 29
7 in - -'04	16 in - -'04	11 in - -'04
	60 ,, - -'05	18 ,, - -'05

RUSSIA.

B_1. 4	B_3. 1	C_1. 2
Borodino in '04	Butakoff in '05	Kagul in '05
Alexander III. ,, '04		Otchakoff ,, '05
Orel ,, '04		
Suvaroff ,, '05		

C_2 2	D. 10	T.B. 18	S.B. 1.
Jemtchug in '05.	6. in '04.	8. in '04.	1. in '05.
Izumrud ,, '05.	4. ,, '02.	10. ,, '05.	

PRESENT DISTRIBUTION.

ENGLAND.

Table 18a.

——	Home.	Chan.	Cruiser.	Res.*	Med.	Foreign.
$30B_1$	—	6	—	7	12	5
$10B_2$	4	—	—	4	2	—
$7B_3$	5	—	—	2	—	—
25aC	—	2	3	16†	2	2
$21C_1$	2	—	—	13	—	6
$50C_2$	3	2	3	20	6	16
$22C_3$	—	2	2	8	4	6
29T.G.	—	—	—	24	5	—
111D	—	71	—	—	28	11
77 T.B.	—	—	—	42	20	15

* Including efficient ships in home ports not in any particular fleet or *completing*.

† Berwick	1	Completing.
Donegal	1	
Essex	1	
Monmouth	1	
Bedford	1	
King Alfred	1	Reserve.
Euryalus	1	
Impérieuse	2	Not adapted to modern fighting.
Aurora	7	
Total	16	

FRANCE.

Table 18b.

——	Atlan.	Med.	China.	Pacific.	N.A.
$11B_1$	2	9	—	—	—
$7B_2$	3	4	—	—	—
$12B_3$	7	4	1	—	—
15aC	8	6	1	—	—
$2C_1$	1	1	—	—	—
$22C_2$	13	5	3	1	—
$18C_3$	6	8	1*	—	3
15T.G.	5	10	—	—	—
23D	13	9	1	—	—
185T.B.	86	99	—	—	—
258.B....	17	8	—	—	—

* **East Indies.**

PRESENT DISTRIBUTION—contd.

RUSSIA.

Table 18c.

—	Baltic.	Med.	China.	Completing.
$9B_1$		1	8*	—
$9B_2$	2	7	—	—
$6B_3$	5	1	—	—
$7aC$	3b	1	3	—
$7C_1$	2	—	5	—
$3C_2$	1	—	2	—
OC_3	—	—	—	—
9T.G.	3	3	3	—
54D	20	6	22	6
87T.B.	48	20	12	7

* Noteworthy.

GENERAL SCHEME OF WAR DISTRIBUTION.

1. *Superior fleets* to be assigned to each hostile fleet (anti-fleets).
2. *Anti-fleet* will take up strategic positions according to enemy's force distribution.
3. *Hostile bases* will be watched by a cruiser force, called Watch Squadron.
4. *A Defence flotilla of T.B.'s* will be attached to all naval bases.
5. *A cruiser and destroyer force* will be assigned to Malta and Gibraltar for watching the Straits and Malta Channel.
6. *$1C_2$ and $1C_3$* will be attached to principal bases for wireless work in order to obviate the necessity of ships actually entering the harbour to communicate.
7. *A force of $1C_3$, 2TG, and 12D* will be stationed at Malta and Gibraltar to harass and block the N. African T.B.'s, if fleet has to pass along that route.
8. *Principal trade routes* will be patrolled by our present non-European Squadrons, reorganised as Trade Protection Squadrons.

WAR DISTRIBUTION.

BATTLE-SHIPS.

Points Assigned to Battle-ships for Comparison of Anti-Fleets.

A.—*Points* = 4. Characteristics:—Good armament, guns all protected, good side armour, 16 knots.

England.	*France.*	*Russia.*
Duncan	Suffren	Tsarevitch.
London		Potemkin
Majestic		Retvisan
Canopus		Pobieda
Renown		

WAR DISTRIBUTION—contd.

BATTLE-SHIPS.

B.—*Points* = 3. Characteristics :—Guns all protected, but growing old, or side insufficiently protected.

England.	*France.*	*Russia.*
Royal Sovereign Class (refitted with Case-mates).	Iéna Bouvet Carnot Charles Martel Brennus Charlemagne	Rostislav

C.—*Points* = 2. Older, insufficient armament, protection, or speed.

England.	*France.*	*Russia.*
Nile Trafalgar	Formidable Magenta Marceau Henri IV.	Ekaterina Navarin

D.—*Points* = 1. Obsolescent or coast defence.

England.	*France.*	*Russia.*
Admiral Class	Hoche Duperre Courbet Jemmapes	Nikolai Apraksin Otchakoff

EUROPEAN FLEETS—contd.

Summary. *Table 19.*

	B_1.	B_2.	B_3.	a/b.*	C_1.	C_2.	C_3.	D.
Baltic (Russia)		2	5	3b	1	2		
Anti-Baltic	2	2	0	0	1	2		
Baltic Watch Squadron				1	1	1	1	
Brest (France)	2	3	7	6a2b	1	10		
Anti-Brest	7	0	0	2	2	4	2	4
Brest Watch Squadron				3	0	4	2	8
Toulon (France)	9	3	5	3a3b	1	5		
Anti-Toulon	12	0	0	2	1	4	2	6
Toulon Watch Squadron				2	1	2	2	6
Black Sea (Russia)	1	7	1	1a	0	0		
Anti-Black Sea	5			1	1	2	0	4
Black Sea Watch Squadron				2	0	2	2	10
Reserve (British)		7	7	1	4	5	5	9

a=modern. b=obsolescent.

NOTATION.

Br.	Brest Fleet (includes all Atlantic forces).
T.	Toulon Fleet.
Ba.	Baltic.
B.S.	Black Sea.

Anti-distribution means a distribution of ships countering that of the enemy.

Anti-Toulon Fleet means a fleet told off to cope with the Toulon Fleet, and similarly Anti-Brest, etc.

(Br.)	Anti-Brest Fleet.
(T.)	Anti-Toulon Fleet.
(Ba.)	Anti-Baltic Fleet.
(B.S.)	Anti-Black Sea Fleet.

B_1, B_2, B_3.	Battle-ships, 1st, 2nd, and 3rd class.
C.D.	Coast Defence.
aC.	Armoured Cruiser.
C_1, C_2, C_3.	Cruisers, 1st, 2nd and 3rd Class.
D.	Destroyer.
T.G.	Torpedo gun-boat.
T.B.	Torpedo-boat.

Table 20.

BALTIC.

Navarin	B_2	2	
Sissoi Veliky	B_2	2	
Alexander	B_3	1	
Apraksin	B_3	1	
Otchakoff	B_3	1	C.D.
Seniavin	B_3	1	C.D.
Peter Veliky	B_3	1	
2 B_2, 5 B_3,	Value	9	

Speed, 13 knots.

ANTI-BALTIC.

Prince George	B_1	4	
Jupiter	B_1	4	
Empress of India	B_2	3	
Revenge	B_2	3	
2 B_1, 2 B_2,	Value	14	

Speed, 15 knots.

BREST.

Suffren	B_1	4	
Masséna	B_1	3	
Neptune	B_2	2	
Formidable	B_2	2	
Henri IV.	B_2	2	
Dufevre	B_3	1	
Courbet	B_3	1	
Dévastation	B_3	1	
Jemmapes	B_3	1	C.D.
Valmy	B_3	1	C.D.
Tréhouart	B_3	1	C.D.
Bouvines	B_3	1	C.D.
2 B_1, 3 B_2, 7 B_3,	Value	20	

Speed, 14 knots.

ANTI-BREST.

Cæsar	B_1	4	
Majestic	B_1	4	
Hannibal	B_1	4	
Victorious	B_1	4	
Illustrious	B_1	4	
Magnificent	B_1	4	
Mars	B_1	4	
7 B_1,	Value	28	

Speed, 15 knots.

TOULON.			*ANTI-TOULON.*		
Iéna	B_1	3	Russell	B_1	4
Bouvet	B_1	3	Exmouth	B_1	4
Jauréguiberry	B_1	3	Montagu	B_1	4
Carnot	B_1	3	Albemarle	B_1	4
Charles Martel	B_1	3	Bulwark	B_1	4
Brennus	B_1	3	Venerable	B_1	4
Charlemagne	B_1	3	London	B_1	4
St. Louis	B_1	3	Irresistible	B_1	4
Gaulois	B_1	3	Implacable	B_1	4
Magenta	B_2	2	Formidable	B_1	4
Marceau	B_2	2	Cornwallis	B_1	4
Amiral Baudin	B_2	2	Duncan	B_1	4
Hoche	B_3	1			
Terrible	B_3	1			
Caïman	B_3	1			
Requin	B_3	1			
Indomptable	B_3	1			
9 B_1, *3* B_2, *5* B_3,	Value	38	*12* B_1	Value	48
Speed of 9 B_1., 15·5 knots.			Speed, 16·5 knots.		

BLACK SEA.			*ANTI-BLACK SEA.*		
Potemkin	B_1	4	Venerable	B_1	4
Rostislav	B_2	2	Canopus	B_1	4
Tri Sviatitelia	B_2	2	Renown	B_1	4
Georgei Pobiedonosets	B_2	2	Barfleur	B_1	3
Dvienadsat Apostolof	B_2	2	Centurion	B_1	3
Ekaterina	B_2	2			
Schesme	B_2	2			
Sinope	B_2	2			
Nikolai	B_3	1			
1 B_1, *7* B_2, *1* B_3,	Value	19	*5* B_1	Value	18
Speed. 14 knots.			Speed, 16 knots.		

GUN COMPARISON. *Table 21.*

Baltic.	*Anti-Baltic.*
14 12″, 3 10″, 12 9″, 34 6″.	12 13·5, 8 12″, 54 6″.
Heavy ... 29	20
Secondary ... 34	54

Brest.	*Anti-Brest.*
10 13·4″, 14 12″, 16 10·8″.	28 12″, 84 6″.
15 6·4, 39 5·5″, (66 3·9″).	
Heavy ... 40	28
Secondary ... 54	84

GUN COMPARISON—contd.

Toulon.		*Anti-Toulon.*
17 13·4″, 20 12″, 16 10·8″.		40 12″, 120 6″.
22 6·4″, 52 5·5″, 51 5·5″ U.		
Heavy ...	53	40
Secondary ...	74 Protected	120
	51 Unprotected.	

Black Sea.		*Anti-Black Sea.*
38 12″, 4 10″, 4 9″, 72 6″.		8 12″, 12 10″, 52 6″.
Heavy ...	46	20
Secondary ...	72	50

The gun comparison table does not scale very heavily in favour of the British Fleets, on account of the large number of heavy slow-firing guns added to the enemy's list by their older ships. Our modern 12-inch mounting, however, fires at least twice as fast as the enemy's older patterns, and some *of the hostile ships which carry these guns are practically non-seagoing.*

Thus, in the Baltic Fleet, four 12-inch, three 10-inch, and eight 9-inch are carried by the old "Peter Veliky" (13 knots) and 3 C.D. ships, which could not stand heavy weather, and this reduces the list to ten 12-inch, four 9-inch, *versus* eight 12-inch and twelve 13·5. In the Brest Fleet eight 12-inch are carried by the "Jemmapes" C.D. class, which reduces the number to 32, mostly old, *versus* 28 modern. Again, 8 heavy guns in the Toulon Fleet are carried by 13-knot patched-up ships ("Caïman" class), which reduces the scale to 45 *versus* 40 brand new.

In the B.S. Fleet the preponderance of 26 is due to the "Ekaterina" class (14 knots), each of which carries six 12-inch, and the "Nikolai" (13 knots), with two 12-inch and four 9-inch.

In spite of these counter-balancing details, the preponderance of slow heavy gun fire in the Franco-Russian Fleets is marked, and ought to be exemplified and *investigated in our Tactical Exercises.*

(*b*) DISTRIBUTION PLAN.—CRUISERS.

ENGLAND. *Table 22.*

	25 aC	24 C_1	50 C_2	22 C_3	120 D	77 T.B.
Total						
European Fleets	7	2	11	8	28	20
Non-European Stations	2	6	19	5	11	15
Reserve and Home Ports	7a }	16	20	9	81	42
Completing	9b }					

(*b*) DISTRIBUTION PLAN.—CRUISERS—contd.

FRANCE.

	15 aC	4 C_1	18 C_2	10 C_3	23 D	185 T.B.	26 S.B.
Toulon	3a 3b	1	5	4	7	99	2
Atlantic	5a 2b	1	10	6	12	86	13
China	2	1	2	—	—	—	—
N. America	—	1	—	—	1	—	—
Pacific	—	—	1	—	—	—	—
Completing	—	—	—	—	3	—	11

RUSSIA.

	7 aC	6 C_1	4 C_2	80 T.B.
Baltic	3b	1	2	48
Black Sea	1a	—	—	22
China	3a	5	2	10

CRUISERS.

WAR DUTIES.

The war duties of cruisers may be classified as follows:—

A.—*Watch Squadrons.*—To watch a hostile fleet or base.

B.—*Fleet Squadrons.*—To accompany Battle Fleet.

C.—*Base Work.*—For service at naval bases.

- *a.* Watching work (such as Gibraltar Strait).
- *b.* Wireless chain (within 120 miles of base).
- *c.* Leaders of Destroyer Divisions directed against hostile T.B. stations.
- *d.* Leaders of T.B. Divisions for harbour defence.

D.—*Trade Protection.*—Patrolling trade routes or ready for such service.

A and B duties always take precedence of C and D.

Table 23.

Total Available.	16* aC.	21 C_1.	50 C_2.	23 C_3.	30 T.G.	111 D.	T.B.†
WATCH AND FLEET.							
Anti-Baltic Fleet	—	1	2	—	—	—	—
Baltic Watch Squadron	1	1	1	1	—	—	—
Anti-Brest Fleet	2	2	4	2	—	4	—
Brest Watch	3	—	4	2	—	8	—
Anti-Toulon Fleet	2	1	4	2	2	6	—
Toulon Watch	2	1	2	2	—	6	—
Anti-Black Sea Fleet	1	1	2	—	2	4	—
Black Sea Watch	2	—	2	2	—	10	—
China Fleet	2	2	4	—	—	6	—
Admiralty	1	1	2	—	—	0	—
Watch and Fleet Work	16	10	27	11	4	44	—
BASES.							
Plymouth Anti-T.B.'s	—	—	—	—	2	12	—
Portsmouth „ „	—	—	—	1	1	12	—
Portland „ „	—	—	—	—	1	6	—
Dover „ „	—	—	—	1	—	12	—
Sheerness „ „	—	—	—	—	2	12	—
Coast Flotillas	—	—	—	—	5	—	—
Gibraltar Watch	—	—	1	2	—	—	—
„ W.T.	—	—	1	1	—	—	—
„ Anti-T.B. Stations	—	—	—	—	2	12	—
Malta Watch	—	—	2	1	—	4	—
„ W.T.	—	—	1	1	—	0	—
„ Anti-T.B. Stations	—	—	—	—	2	12	—
Non-European Bases	—	—	1	—	7	6	—
Watch, Fleet and Base Work	16	10	33	18	26	106	—
TRADE.							
N.A. Route	—	1	1	—	—	—	—
West I. Route	—	1	2	—	—	—	—
Liz. to Gib.	—	1	4	—	—	—	—
Gib. Cape	—	1	1	—	—	—	—
Cape-Indo.	—	1	2	—	—	—	—
Indo-China	—	1	2	—	—	—	—
Watch, Fleet, Base and Trade	16	16	45	18	26	102	—
Reserve	—	5	5	5	4	7	—

* Total—25, but 9 are inefficient, viz.: Impérieuse ... 2
Aurora ... 7
9

† For distribution of T.B.'s see Torpedo Flotilla Defence Organisation.

Notes.

The Cruiser Watch Squadron for any port would be attached to the anti-fleet opposed to that port; thus the Brest Watch Squadron would be attached to the anti-Brest Fleet.

Fleet and watching duties take precedence of base and trade duties, and cruisers employed in the latter would be available for fleet

and watching work. The Gibraltar and Malta watch vessels are intended to patrol and watch the Straits and Malta Channel.

2T.G. and 12D are attached to Gibraltar and Malta for service against the N. Africa T.B. stations when the Battle Fleet intends to pass along the route.

The 5 coast flotilla T.G.'s are intended to work with T.B. defence flotillas attached to various ports in United Kingdom. The 7 T.G.'s attached to non-European bases are intended to work with harbour defence flotillas.

COMPARISON OF NUMBER OF CRUISERS REQUIRED FOR TRADE PATROLS AND EFFICIENT CRUISERS ON NON-EUROPEAN STATIONS. (EXCLUDING CHINA).

NON-EUROPEAN SQUADRONS.

Table 24.

	aC	C_1	C_2	C_3	D	Non-efficient.
North America	—	1	4	1	2	
S. E. Coast	—	—	1	—	—	
Pacific	—	1	1	—	—	Amphion.
Cape	—	1	2	1	—	Barracouta and Blanche.
East Indies	—	—	2	2	—	
Australia	—	1	—	1	—	Archer and Pylades.
Total (Present)	—	4	10	5	—	
War Scheme *Trade Patrols*	—	6	12	—	—	
CHINA.						
Present	1	3	5	—	9	Fearless.
War Scheme	2	2	4	—	6	

T.B. DEFENCE FLOTILLA ORGANISATION.

Strategy is sometimes hampered by doubts as to the ability of a port to defend itself against attack. Nothing contributes so much to the defence of a port as a strong force of T. boats, and this particularly applies to Alexandria and Hong Kong, and a defence flotilla of T.B.'s should be attached to naval ports, with 3rd-class cruisers as depôt ships carrying spare torpedoes, and T.G.'s as leaders of divisions.

There are 13C_3 which cannot steam more than 16 knots, but which, fitted with 12-pounder guns and well placed search-lights, could serve as supports to a T.B. division against destroyers. So long as a flotilla did not move far from its base, T.G.'s might also be distributed for this work.

LIST OF C_3 AND T.G.

Suitable for Port Defence Work.

"Barracouta"	4
"Archer"	7
"Fearless"	2
Total	**13**

The 4·7 guns in the "Barracouta" class, and the 6-inch guns in the "Archer" class would be replaced by 12-pounders for this work.

Distribution of T.G.

a.	"Hazard" class	5
	Re-boilered	13
b.	Old boilers	11

The T.G.'s for defence flotilla work would have their two 4·7 guns replaced by four 12-pounders.

The 13 C_3 (inefficient for fleet work), T.G.'s, and T.B.'s would be distributed as follows. The + numbers indicate extra T.B.'s required:

Flotilla Defence Distribution.

Table 25.

—	C_3 13	T.G. 18 a.	T.G. 11 b.	T.B. 77	T.B.'s required not at present available.
War Distribution List	—	4	—	—	—
Milford	—	1	1	8	—
Berehaven	1	1	—	—	+4
Kingstown	1	—	1	—	+3
Portsmouth	1	1	1	8	+8
Plymouth	1	1	1	8	+8
Portland	1	—	1	6	—
Sheerness	1	—	2	8	+8
Hull	—	—	1	—	+3
Gibraltar	1	2	—	6	+6
Malta	1	2	—	6	+6
Aden	—	1	—	3	+3
India	1	1	—	3	+12
Singapore	—	1	—	3	—
Hong-Kong	1	1	1	6	+12
Bermuda	—		1	4	—
Cape	—	—	1	2	+4
Alexandria	1	1	—	6	+6
Total	11	17	11	77	+83

Hostile Moves.

The principal moves open to the enemy will now be examined, and can be categorised as follows:—

The fleets to be considered are **FOUR** in number.

Fleet.	Abbreviation.	Notation (for Fleet.)
Baltic	Ba.	a
Brest	Br.	b
Toulon	T.	c
Black Sea	B.S.	d

In the Brest Fleet are included Rochefort, Lorient, and Cherbourg Detachments.

The number of principal moves open to each fleet is three or four, viz.:—

Move.	Abbreviation.	Notation (Index),
Remain at Base	—	1
Proceed to Mediterranean East ...	M.E.	2
,, ,, West ..	M.W.	3
,, Atlantic	Atl.	4

The enemy's preliminary policy might be examined in the form of—

$a^1\ b^1\ c^1\ d^{1*}$, $a^2\ b^2\ {}^1\ d^1$, $a^3\ b^1\ c^1\ d^1$,
$a^2\ b^1\ c^1\ d^1$, $a^2\ b^3\ c^1\ d^1$, $a^3\ b^2\ c^1\ d^1$,
$a^2\ b^4\ c^1\ d^1$, etc.,

which would admit of 256 combinations. By eliminating the improbable and combining similar phases, these can be reduced to 16. *But this method of investigation is faulty*, as a strategic policy must depend not so much on the enemy's general scheme of concentration, which is only half known, as on the synchronous positions and coal conditions of the fleets at any particular moment.

Accordingly it will be simpler to point out the principal moves open to each hostile force separately and the general counter strategy to be adopted by the British Fleets.

Toulon Fleet.

Approximate strength, $9B_1$, $3B_2$, 3aC, $4C_2$, 6D.

This fleet has three principal moves:—

a. Proceed to Mediterranean E. to combine with B.S.

b. Proceed to West to meet Brest Fleet in Mediterranean West or in Atlantic.

c. Remain at base.

A.—*If the Toulon Fleet proceed E.*, the possible rendezvous are in:—

1. Gulf of Sidra.
2. S. of Greece.
3. Ægean Sea.
4. Levant.

Coal Conditions.

Safe coal limit may be taken as 1,500 miles, and distances are:—

——	Toulon.	Bizerta.	Dardanelles.	Sevastopol.
G. of Sidra	920	520	620	1,070
Matapan	975	660	298	748
Dardanelles (Ægean)	1,280	925	—	450
Marmorice (Levant)	1,390	1,065	305	750

* *Letter* indicates a particular *Fleet* and its *Index* ($^{1\ 2\ 3\ 4}$) its first *Strategic Move*.

Thus a^4 indicates Baltic Fleet to Atlantic.
a^2 ,, ,, ,, Medit. E. (impossible)

Gulf of Sidra is an out of the way area; but it has no coaling facilities, and B.S. Fleet would have to proceed in company to Bizerta, 520 miles farther on.

S. of Greece would give the best coal margin to the French and Russian Fleets, but is too easily watchable from Malta.

The Ægean is a very probable rendezvous area, as the B.S. Fleet, on account of its weakness in cruisers, will hesitate to venture out too far.

Marmorice is rather far East for Toulon Fleet to go.

B.—*If the Toulon Fleet goes West*, the possible rendezvous are in:—

1. N. African Coast at Oran.
2. The Afric-Atlantic Coast.
3. Atlantic Islands.
4. Atlantic at sea.

Coal Conditions.

N. African Coast. The safe limit for the Brest Fleets, if accompanied by its older ships, may be taken as 1,200 miles, and is about 50° E. of Oran, where they would have to coal. From Ushant to Toulon is 1,640 miles.

On the Afric-Atlantic Coast the coal line of the Brest Fleet cuts the coast about 90 miles S. of Cape Bogador.

The Atlantic Islands are too far, unless fleets are certain of finding their colliers there.

——	Toulon.	Brest.	Oran.
Azores	1,670	1,100	950
Madeira	1,310	1,100	1,190
Canary	1,430	1,320	800

R.V.'s in the open Atlantic must not be past a 900 mile circle from Brest or Oran, unless fleets intend to coal at one of the islands. This keeps the Toulon Fleet to E. of meridian 24 W.

C.—*The Toulon Fleet may remain at its base* for some time while the cruisers harass trade, and a T.B. warfare is directed against the British Battle Fleets.

Brest Fleet.

Probable strength, $2B_1$, $3B_2$, 6aC, $6C_2$.

This fleet has three principal moves:—

a. To Atlantic to meet Toulon Fleet.
b. To Mediterranean W. to meet Toulon Fleet.
c. Remain at base.

The Anti-Brest Fleet can take up a position opposite Brest (position C), or off Finisterre, with Cruisers Squadron before Brest (position F), or off Cape St. Vincent, with Cruisers Squadron before Brest (position G).

Baltic Fleet.

The seagoing Baltic Fleet would number about $2B_2$, 3aC, (old), $1C_1$, $2C_2$.

Its moves are as follows:—

a. Cherbourg, by Dover ... 1,465 miles.
b. To Brest, *viâ* Scotland ... 2,090 ,,
c. Remain in Baltic.

(*c*) is the most probable, as this fleet is not modern enough to materially strengthen the Brest Fleet.

A Cruiser Watch Squadron and a strong force of T.B. should be stationed at Dover, and the Anti-Baltic Fleet of $2B_1$, $2B_2$, could either combine with the Anti-Brest Fleet or remain at Portland.

Black Sea Fleet.

The Black Sea seagoing Fleet numbers $1B_1$, $7B_2$, 1aC.
It has three principal moves:—

a. To Mediterranean E. to meet Toulon.
b. To Mediterranean W. to meet Toulon.
c. Remain at base.

a. If the B.S. Fleet proceed into the Mediterranean East it may meet Toulon in the following areas:—

Ægean Sea.
S. of Greece.
Levant.
Sidra.

The Ægean Sea is the most probable area, as the B.S. Fleet is weak in cruisers, and would not venture farther West than absolutely necessary. A strong force of T.B.'s would be despatched to the Ægean, which Russia would try and get a firm grip of as soon as possible. The Toulon Fleet coaling at Bizerta would have to come 850 miles to the Ægean.

b. If the B.S. Fleet proceed to the West its first coaling port would be Bizerta, 923 miles from the Dardanelles. To reach this port with a good chase margin it would have to coal in the Ægean, news of which ought to be quickly received and the fleet shadowed.

Counter Moves.

The *main issue must concentre round the main fleet*, and accordingly the principal question to be considered is the position to be taken up with regard to the Toulon Fleet.

As regards trade, *any idea of keeping the Mediterranean route open at the commencement of a Franco-Russian war should be abandoned*, and arrangements made for deflecting all trade round the Cape.

The counter-moves to the Toulon Fleet are:—

a. Blockade of Toulon.
b. Strategic positions in Mediterranean W.
c. Position based on Malta to prevent the Toulon-Black Sea junction.
d. Position based on Gibraltar to prevent the Toulon-Brest junction.

a. Unless a secondary base is available in the Balearic Islands, the blockade of Toulon is dangerous, and unadapted to modern warfare, besides requiring a larger number of vessels than would probably be available.

b. A strategic position may be taken up in Mediterranean W. with the intention of following the Toulon Fleet whichever way it goes, and with a Cruiser Watch Squadron before Toulon. This position would be:—

85' S. of Port Mahon,

with the following distance table:—

Malta ...	...	520
Gibraltar	...	520
Toulon ...	...	295
Algiers	...	125
Bougie ...	...	95
Bizerta ...	...	255

The disadvantages of such a position are obvious. It is too far from Malta and Gibraltar, and to shift sensibly nearer to either of these bases would depreciate its value as regards Toulon, and place the fleet in a narrower area, where T.B.'s would have more chance of finding it.

Its communication line to both these bases is flanked by hostile T.B. stations, and communication, whether by wireless chain or despatch, being very exposed to attack, important news might take some time to reach the Admiral.

The T.B. stations round it (Plan 7) make it a risky position for the Battle Fleets, and it will grow riskier as S.B.'s develop year by year.

The Mediterranean is admirably suited to T.B. warfare, and it is France's evident intention to render the Toulon-Corsica-Algiers-Bizerta area as dangerous as possible to hostile fleets; a sure index of this is the large number of T.B.'s and S.B.'s building at present.

It would be possible to block up the African T.B. ports for two or three nights, but not to do so continuously, which would be necessary if the Anti-Toulon Fleet took up a permanent position in this area.

Let this position, then, be rejected.

c. The Anti-Toulon Fleet may be based on Malta, and endeavour to prevent the junction of the Toulon and B.S. Fleets.

This leaves the Brest Fleet and the Channel exposed.

The positions would be as follows:—

The Anti-Toulon Fleet 50' E. of Malta.

The Toulon Watch Squadron off Toulon.

The Malta Watch Squadron of C_3 and destroyers in Malta Channel.

The Anti-B.S. Fleet, composed of fast, reliable steamers, *300 miles east of Malta,* working in co-operation.

The B.S. Watch Squadron in the Ægean.

NOTE.—A secondary base in the Balearic Islands would be necessary, if the Toulon Watch Squadron is to be accompanied by destroyers.

The Toulon Fleet would hesitate to go East with a powerful fleet lying on their line of communication with Toulon and Bizerta.

This may be called the Malta Main Fleet Policy, and if it was certain that the Toulon Fleet would come E., this policy might be correct. There are, however, strong arguments against it.

Plan 7.

FRENCH T B STATIONS
IN
WEST MEDITERRANEAN
SICILY
CORSICA
SARDINIA
MINORCA
IVIZA
NOTE:

OBJECTIONS TO MAIN FLEET AT MALTA.

1. The Toulon Fleet may go W. and if the Brest Fleet sails, the Anti-Brest following them may be led to an Atlantic R.V., where they would fall in with the Toulon Fleet.

2. Malta is not a good base for a large fleet of 17 battle-ships.
It has no real resources of its own.
Its communication line is flanked by Bizerta and hostile T.B. stations.
It is limited in space.

3. If the Anti-Brest Fleet did not receive news of the Toulon Fleet passing Gibraltar, it might be forced into action by the combined Brest and Toulon Fleets, numbering $11B_1$, $6B_2$, 9aC, $2C_1$, $15C_2$.

The Toulon Fleet, however, going W. ought to be sighted as they pass Gibraltar and go on to Brest (6 days at 15 knots). The Anti-Brest Fleet would fall back on Plymouth.

The Anti-Toulon Fleet would have to coal (2 days) and proceed to Gibraltar and on to Plymouth (13·5 days at 15 knots). This leaves the Channel dominated by the Brest and Toulon Fleets for over a week, though the Anti-Brest and Anti-Baltic would still form a strong combination of $9B_1$, $2B_2$, 6aC, $4C_2$, with $7B_2$, $7B_3$ in reserve at home ports. The $7B_3$, however, may be considered obsolete.

d. The Anti-Toulon Fleet take up a position based on Gibraltar to prevent the junction of the Brest and Toulon Fleets, and to shut the latter up in the Mediterranean.

This leaves Egypt and Malta exposed, but danger in this direction is more imaginary than real, as the execution of any plans in these directions would be very risky, with a superior force "in being."

The Anti-Toulon Fleet would lie W. of Gibraltar with a Cruiser Squadron of 2aC, $1C_1$, $2C_2$, watching Toulon. The Gibraltar Watch Squadron would patrol the Straits.

The advantages of this position are:—
Great certainty of intercepting a hostile fleet.
Route to England shorter, and not so exposed as that to Malta.

The disadvantage is that Malta and Egypt are left exposed; but very little is to be gained by bombarding Malta, and *if a determined attempt was made on Egypt*, the African T.B. stations would be masked by the Malta and Gibraltar Destroyer Squadrons, and Anti-Toulon Fleet would go E. Danger in these directions would be lessened by strong T.B. defence flotillas at Malta and Alexandria.

An Egypt invasion scheme would be extremely risky till the command of the E. Mediterranean was ensured, and no attempt of this sort could be made with the Anti-Toulon Fleet only 7 days from Alexandria, viz.:—

	Hrs.
To Gibraltar	4
To Malta, 975 miles at 15 knots ...	65
To coal at Malta	48
To Alexandria, 820 miles at 15 knots	55
	172 or 7·16 days.

A cruiser force would remain in Mediterranean E., based on Malta.

The position to be taken up by the *Anti-B.S. Fleet* requires consideration. *It may be left at Malta*, in which case it would serve as

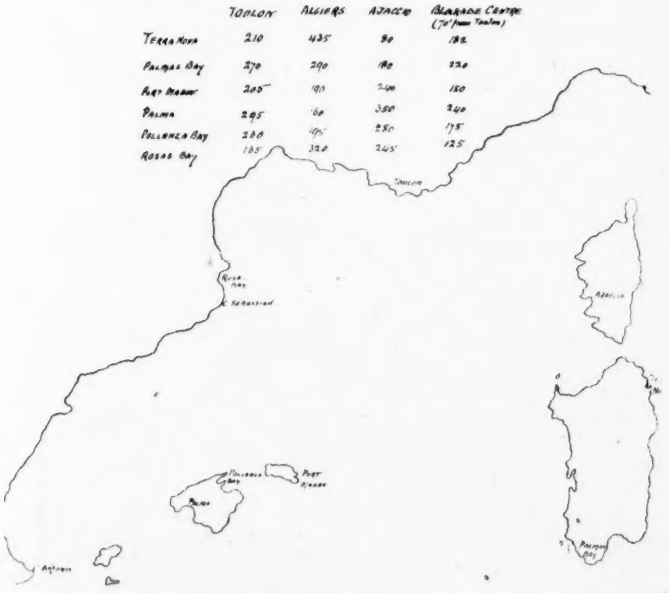
a "fleet in being" check on Egypt, or *it may combine with the Anti-Toulon Fleet* and assist to bar the Straits. The latter course is advised, as its attitude must be, more or less, a passive one if left at Malta. As regards Egypt, anti-invasion plans should be carefully drawn up by the Army, and all possible landing places marked down and entrenched. An attack on Egypt would be advantageous to the British Fleets, for it would tie the hostile fleets to the Levant and bring on a decisive action; disabled Russian and French ships would have to pass by Malta or through the Ægean Sea, which is admirably adapted for destroyer and torpedo warfare. The Anti-B.S. Fleet, if left at Malta, should be composed of fast, reliable 16-knotters, able to outrun most of the Toulon Fleet.

GENERAL NOTES.

1. The position within the Toulon-Algiers-Corsica area should be avoided at the outbreak of war. It is the French policy to make this position as strong as possible. It will not take long to ascertain whether our cruisers and destroyers are able to effectually mask the Mediterranean T.B. stations, and if they can do so, a West Mediterranean position could be taken up. This position, however, (Position K) depends on the possession of a secondary base in the Balearic Islands or Sardinia, which involves further complications. (Plan 8.)

BASES FOR TOULON BLOCKADE.

Plan 8.



2. On the outbreak of war trade should be deflected round the Cape, and the coaling arrangements on this route should be placed on a satisfactory footing. *Dakka should be masked.* Immediate information should be circulated of all possible trade harassers and suspected areas.

3. China policy. Generally speaking, ex-centre movements, *i.e., the removal of War Squadrons from the real war centre*, should be avoided; but the position of Russia in China is exceptional, as she is concentrating there the greater part of her naval force, and the Anglo-Japanese treaty necessitates the maintenance of a moderately powerful Eastern Fleet.

Strategy Suggested.

The strategy suggested will now be summarised as follows:—

Anti-Toulon Fleet.—12B_1, 2aC, 1C_1, 4C_2, 2C_3; 30 miles West of Gibraltar Straits.

Toulon Watch Squadron.—2aC, 1C_1, 2C_2, 2C_3, 6D; off Toulon. If C_3 and D are to accompany the Toulon Watch Squadron, a coaling base in the Balearics or Sardinia would be necessary.

Anti-B.S. Fleet.— 5B_1, 1aC, 2C_2; co-operating within 20 miles of Anti-Toulon Fleet.

A Black Sea Watch Squadron.—2aC, 2C_2, 2C_3, 10D; in the Ægean.

Anti-Brest Fleet.—7B_1, 2aC, 2C_1, 4C_2, 2C_3; in Channel entrance, based on Plymouth. Position C or D.

Brest Watch Squadron.—3aC, 4C2, 2C3, 8D; off Brest.

Anti-Baltic Fleet.—2B_1, 2B_2, 1C_1, 2C_2; at Plymouth, co-operating with Anti-Brest.

Baltic Watch Squadron.—1aC, 1C_1, 1C_2, 1C_3; in North Sea.

The Toulon and Brest Watch Squadrons could be supplemented by the cruisers attached to their fleets.

If the Anti-Brest Fleet came S., there would be massed off Gibraltar a fleet of 24 B_1.

Such a fleet would tend to paralyse hostile fleets, both in the Atlantic and Mediterranean; but it is absolutely necessary to distribute it *sufficiently widely apart as to lessen the danger of T.B. attack*, and by reducing the actual fleets to a practical one-man size, give the individual Admirals full scope.

The keynote of success with a very large fleet consists in dividing it into separate fleets, co-operating within supporting distance, say 30 to 40 miles, of one another. The number of vessels anchoring in an open roadstead at night should not exceed six.

Blockades have practically no part in the above sketch.

An endeavour to effectually watch an enemy's port employs a large number of vessels to no purpose, for the first stormy night will enable the hostile fleet to escape unseen.

A considerable amount of space has been taken up with distribution details; but a *strategic example scheme cannot be drawn up without a basis of number*, depending upon an assumed hostile force, *and it must be given in its entirety*, so as to give a correct idea of the forces engaged and in reserve.

Sketch Chart of Strategy Proposed

DISTRIBUTION

		B1	B2	B3	aC	C1	C2	C3	D
1	Baltic Watch				1	1	1	1	
2	Reserve			7	(7)(9b)	4	5	5	9
3	Anti Baltic	2	2			1	1	2	
4	Anti Brest	7			2	2	4	2	4
5	Brest Watch				3		4	2	8
6	Anti Toulon	12				2	1	4	2	6
7	Anti Black Sea	5				1	1	2	0	4
8	Toulon Watch					1	1	2	2	6
9	Black Sea Watch					2	1	2	2	10

1 Dover or Sheerness
2 Plymouth and Portsmouth
3 Falmouth
4 Position of Cape St Vincent
5 15° W. of Dunkirk
6 30° W. of Gib.
7 20° from 6
8 15° S. of Scilly
9 Position of Cape Matapan 22° E.

SUMMARY.

The answer to the original question may be briefly stated as follows:—

1. The main divisions of the enemy's force should be opposed by superior, and, if possible, homogeneous, fleets, which may be called Anti-Fleets.

2. On the outbreak of war, these Anti-Fleets should be stationed in *strategic positions*, depending on the position of the enemy's forces, and fulfilling as closely as possible the following conditions:—

Commanding the enemy's most advantageous route.
Within 150 miles of a coal and repair base.
Within 150 miles of a central cable.
Not too close to hostile T.B. stations.

Base Strategy.

Base Strategy consists in keeping the fleet attached to a base, and has the following advantages:—

1. Fleet is kept full up with coal, and in a state of mechanical efficiency.
2. Central news immediately available.

Base Strategy is not, however, applicable to a naval Power that aims at commanding the trade routes, and will not be further discussed.

CONCLUSION.

This essay must now conclude. There has been no opportunity for consulting books, and it is entirely based on experience in manœuvres, torpedo operations, etc. Some of its faults must be ascribed to its having necessarily to take a subordinate position to Service work. A little more leisure would have rounded off its edges. With so many ships in commission, the mere routine work of a community absorbs so much time that much of its mental energy remains latent. A certain amount of leisure is required to clarify ideas and reduce them to a practical shape. Our lack of text books is due to routine work swallowing up most of the time available. Full advantage, however, should be taken of fleets being in permanent commission to put ideas to a practical test.

The following matters are worth consideration:—

1. *Forming chains*, and greatest length at which they are easily workable.
2. *Coaling routines for Watch Squadrons.*
3. *Watching Gibraltar and Malta Straits*, to ascertain the possibility of a fleet passing unobserved.

One fault is that matters are not always beaten into shape before being practically tested. Ideas require to be thoroughly sifted and clearly defined. Time should be given to compile reports. Reports ought to be intelligently analysed, and officers encouraged to read the final conclusions. Many matters never seem to come to any definite result; they crop up and then disappear in a misty kind of way. Experience gained is packed up somewhere, and never seems to reach the average officer. Within the last ten years, however, great strides have been made in war and battle studies. The Greenwich War Course and Tactical Exercises, if studied, must stir up some ideas in the minds

of those who read them. Individuals in the lower planes of a community respond to the keynotes struck above them, and shape themselves according to the prevailing ideas of their superiors. There is, and always must be, a cult which wraps itself up in trivialities of peace. But within the last ten years a mental yeast has been working right through the Navy, and its effect can be seen in War Courses, Tactical Exercises, Long Range Firing, and Educational Reform. *The present is a Period of Change.* Reforms which have been simmering and developing for some years are now suddenly bursting into shape. For the next decade a great deal of energy, intelligence, and interest will be required to nurse these schemes to a fruitful maturity; capacity to devise remedial measures and overcome growing defects, and energy to keep the whole in working order. Of energy and intelligence the Navy has its full share; but interest, which is the spirit of all work, often dies out for want of encouragement or strays off into peace paths. The result is that an officer may suddenly find himself in a responsible position with no more real knowledge of the matter in hand than the writer of a fanciful article in the *Daily Mail*.

Special branches are being thrown off from the main current of naval work, and there is always a tendency for these to swell and aggrandise themselves at the expense of the Service. A keen, sound judgment is necessary to apportion to each its proper sphere of work, and yet bind them all together as a harmonious working whole.

Another line of strain is the growing tendency fomented by frothy papers to magnify grievances and destroy the healthy sympathy between men and officers which is the characteristic of a smart ship.

Officers should choke the growth of unwholesome ideas by keeping on sound terms with their men. Discipline should be enforced without too much worry, healthy recreations encouraged, and officers should set a high example of duty to the men under them. This essay is wandering from its course, but these are matters of primary importance. The modern naval battle will last about an hour, and will decide an Empire's fate. If every officer cultivated some spark of war interest in himself and his men, at the end of that hour the Cross of St. George will look down on a crushed-up enemy.

In the category of war subjects there are two which may be looked upon as pillars of success: one is Tactics, and the other is the subject of this essay—Strategy.

VI.

APPENDIX.

COAL REQUIREMENTS.

We will discuss first the requirements of each class of vessel and then of each squadron.

Battle-ship.

Capacity, 2,000 tons.

A certain reserve must always be kept on board for battle and chase.

Let reserve = 1,000 miles at 15 knots = 800 tons.

Cruising stock = 2,000 − 800 = 1,200.

This would last 11 days at 10 knots.

Take average speed as 10 knots, for battle-fleet on taking up a position will economise coal as much as possible.

Then, *Cruising for 24 days at 10 knots* = 2,592 tons.
In harbour for 6 days = 60 „
Coal for month = *2,652* „
= 2,700 „

Armoured Cruiser.

Capacity ("Drake"), 2,200 tons.
"Cressy" and "County," 1,600 tons.

Chase reserve = 800 miles at 20k. = 40 hours.
= 40 × 18 = 720 tons; say 750 tons.

Cruising Stock ("*Drake*"), 1,450.
"*County*," 850.

Average speed, 15 knots.
Coal per hour at 15 knots = 8 tons.
Cruising 24 days = 4,608 tons.
Harbour 6 days = 60 tons.
Per month, 4,668; say 4,600 tons.

Cruiser, 1st Class.

Same as armoured cruiser:—
4,600 tons per month.

Cruiser, 2nd Class.

Capacity, 1,000 tons.
Reserve, 1,000 at 18 knots = 56 hours = 56 × 8 = 448 tons.
Cruising Stock = 552 tons.
Average speed 12 knots = 3·2 per hour.
Cruising 24 days = 1,844 tons.
In harbour 6 days = 30 tons.
Per month = 1,874; say 2,000 tons.

Cruiser, 3rd Class.

Capacity, 500 tons.
Reserve 900 at 18 knots = 50 hours = 50 × 6 = 300 tons.
Cruising coal = 500 − 300 = 200 tons.
Average speed 12 knots = 2 tons per hour.
Cruising for 24 days = 1,150 tons.
Harbour 6 days = 12 tons.
Coal per month = 1,162; say 1,200 tons.

T.B. Destroyer.

Capacity, 80 tons.
Reserve 6 hours at full speed = 6 × 6·25 = 38 tons.
Cruising = 80 − 38 = 42.
Average speed 15 = 1·12 per hour.
Cruising 3 days at sea and 2 in harbour.
Cruising 18 days = 644 tons.
Harbour 12 days = 2 tons.
Per month = 646 tons.

These estimates, if the fleet are cruising quietly in definite positions, will be too great; if steaming hard, particularly in the case of cruisers, too small; but fleets will rarely be steaming continuously at full speed for weeks on end.

The Cruiser Watch Squadron will be considered separately, as their conditions are entirely different.

COAL REQUIREMENTS FOR TOULON WATCH SQUADRON.

Armoured Cruiser ("Drake" Class).

Malta to Toulon, 600 at 20 knots = 30 hours = 30 × 18 = 540.
Reserve, 900 miles at 20 knots = 45 hours = 45 × 18 = 810.

Total 1,350

Cruising stock = 2,200 − 1,350 = 850.
Cruising at average of 12 knots = 5 tons per hour.
1st watch period will be 170 hours, or 7·05 days.

But after first despatch on outbreak of war, speed of 15 knots in going and returning to coal will be sufficient.

The Coal amounts will be:—

	Tons.	Hours.
To return to base, at 15 knots (from Reserve)	300	40
To Coal - - - - - -	—	48
To go at 15 knots - - - -	300	40
Reserve - - - - - -	810	—
Cruising Stock - - - - -	1,090	218 or 9 days.
Watch Period at 12 knots - - -	—	*346*
Total Period - - - - -		14·4 days.

No. of coalings per month, 2.

Coal per month at 1,700[1] *tons per time,* 2 × 1,700 = *3,400 tons.*

TOULON WATCH SQUADRON.

Cruiser, 1st Class.

Same as armoured cruiser:—
3,400 tons per month.

Cruiser, 2nd Class.

"Gladiator," capacity, 1,100 tons.
To Toulon, 600 at 19 = 35 hours = 35 × 10 = 350 tons.
Reserve, 800 at 19 = 42·5 = 42·5 × 10 = 425 „

Total ... ... 775 tons.

Cruising Stock 1,100 − 775 = 325.
At 10 knots, consumption is 2·3 per hour.
1st watch period = 140 hours = *5·8 days.*

[1] *i.e.,* Capacity − Reserve + Amount of Reserve used returning to base = 2,200 − 810 + 300 = 1,690 tons.

After first despatch:—

	Tons.	Hours.
To return at 15 (from Reserve) - - -	224	40
To Coal - - - - - -	—	48
To go - - - - - -	224	40
Cruising Stock - - - - -	451	—
Watch Period - - - - -	—	196=8·1 days.
Total „ - - - - -	—	324 or 13·5 „

No. of coalings per month, 2·2.

Coal per month at 900[1] tons a time = 1,980.

Cruiser, 3rd Class.

Capacity 500 tons.
To Toulon, 600 at 18 = 34 hours = 34 × 6 = 204 tons.
Reserve, 800 at 20 = 40 hours = 40 × 7·7 = 308 tons.

The coal capacity would barely permit the "Pelorus" class to steam from Malta to Toulon, and to be immediately chased from Toulon to Gibraltar. *Unless some coaling anchorage is available* on the coast of Spain or in the Balearic Islands, *3rd class cruisers could not be used for Toulon Watch Work.*

B.S. WATCH SQUADRON.

Armoured Cruiser.

Capacity, 1,600 tons.
Malta to Syra,[2] *540 miles at 20 knots* = 27 hours = 27 × 18 = 486 tons.
Reserve, 800 miles at 20 knots = 40 hours = 40 × 18 = 720.
Cruising Stock, 1,600 — 1,206 = 400 tons.
Consumption at 12 knots, 5 tons per hour.
1st watch period = 80 hours = 3·3 days.

Afterwards coaling in Matapan Area, and taking Syra as central position.

To Syra 140 miles (from coaling anchorage) at 15 k. = 9·5 = 9·5 × 7·5 = 72.

Reserve - - - - - -		*720 tons.*
Cruising Stock -	1,600 — 792 =	808
Watch Period - - -	=	161 hrs.=*6·7 days.*

Time.	Hours.
To Coaling Anchorage say - - -	10
„ Coal 1,000 tons - - - -	36
„ Proceed to Position - - -	10
Watch Period - - - - -	161
Total Period - - - - -	*217 hours = 9 days.*

Coal per month = 1,000[3] × 3·3 = *3,300 tons.*

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[1] *i.e.*, Capacity – Reserve + Amount of Reserve used = 1,100 – 425 + 224 = 899 tons.

[2] May be taken as centre of Ægean.

[3] *i.e.*, Capacity – Reserve + Amount of Reserve used = 1,600 – 720 + 72 = 950 say 1,000 tons.

Cruiser, 2nd Class.

Capacity, 1,100 tons.
Malta to Syra, 540 at 19 = 29 hours = 29 × 10 = 290 tons.
Reserve, 800 at 19 = 42·5 = 42·5 × 10 = 425 „
Total ... ... 715 „

Cruising stock = 1,100 − 715 = 385.
At 12 knots, consumption is 3·2 tons per hour.
1st watch period = 120 hours = *5 days.*

Afterwards coaling in Matapan Area.
To Syra, 140 miles at 15 knots = 9·5 hours = 9·5 × 5·6 = 54.
Reserve, 425.
Cruising Stock = 1,100 − 479 = 621.
Watch Period - - - - = 194 hours = *8·1 days.*

Time.	Hours.
To Coaling Anchorage say - - -	10
„ Coal 750 tons - - - - -	36
„ Proceed to Position - - - -	10
Watch Period - - - - -	194
Total Period - - - - -	250 = *10·8 days.*

Coal per month = $750 \times \frac{30}{10{\cdot}8}$ = 2,080 tons.

Cruiser, 3rd Class.

Capacity, 500 tons.
Malta to Syra, 540 at 20 = 27 hours = 27 × 7·7 = 208.
Reserve, 600 at 20 knots = 30 hours = 30 × 7·7 = 231.
Cruising stock = 500 − 440 + 60.
Consumption at 10 knots = 1·5.
1st watch period at 10 knots = 40 hours = 1·6 days.

Afterwards, *if coaling in Matapan area*:—
To Syra, 140 miles at 10 k. = 14 hours = 14 × 1·5 = 21 tons.
Reserve, 600 at 20 knots = 231.
Cruising stock = 500 − 231 = 269.
Cruising at 10 knots, consumption is 1·5 tons.
Watch period = 180 = *7·5 days.*

Time.	Hours.
To Coaling Anchorage, say - - -	15
„ Coal 300 tons - - - - -	36
„ Proceed to Position - - - -	15
Watch Period - - - - -	180
Total Period - - - - -	246 hrs. or *10 3 days.*

Coal per month = 3 × 300 = 900 tons.

Destroyer.

Capacity, 80 tons.
Malta to Matapan Area, 435 at 15 = 29 hours = 29 × 1·2 = 33 tons.
Reserve 150 at 25 = 6 hours = 6 × 6·2 = 37·2.

Destroyers would have to coal immediately on arrival at Matapan Area.

Reserve - - - - - -	40 tons.
To Syra 140 at 12 = 12 × 1 - - -	= 12
Cruising Stock = 80 — 52 - - -	= 28
Consumption at 12 knots - - -	= 1 ton.
Watch Period - - - - -	= 28 hours.

Time.	Hours.
To Coaling Anchorage - - - -	12
„ Coal 55 tons - - - - -	24
„ proceed to Position - - - -	12
Watch Period - - - - -	28
Total Period - - - - - -	76 hrs. = *3·2 days.*

Coal required = 55[1] tons for 3·2 days.

$$\textit{Per month} = \frac{30}{3{\cdot}2} \times 55 = 9{\cdot}35 \times 55 = \textit{515}.$$

COAL REQUIREMENTS.

Anti-Toulon Fleet.

Ships.	——	Coal.
$12B_1$	12 × 2,700	32,400
2aC	2 × 4,600	9,200
$1C_1$	1 × 4,600	4,600
$4C_2$	4 × 2,000	8,000
$2C_3$	2 × 1,200	2,400
6D	6 × 650	3,900
Requirements per month		60,500 tons.

Anti-Brest Fleet.

$7B_1$	7 × 2,700	18,900
3aC	3 × 4,600	13,800
$1C_1$	1 × 4,600	4,600
$4C_2$	4 × 2,000	8,000
$2C_3$	2 × 1,200	2,400
4D	4 × 650	2,600
Per month		*50,300* tons.

Toulon Watch Squadron.

2aC	2 × 3,400	6,800
$2C_1$	2 × 3,400	6,800
$2C_2$	2 × 2,000	4,000
Per month		*17,600* tons.

[1] *i.e.*, Capacity - Reserve + Amount of Reserve used = 80 - 40 + 12 = 52, say 55.

ANTI B.S. SQUADRON.

Ships.	——	Coal.
$5B_1$	5 × 2,700	13,500
1aC	1 × 4,600	4,600
$1C_1$	1 × 4,600	4,600
$2C_2$	2 × 2,000	4,000
$2C_3$	2 × 1,200	2,400
4D	4 × 650	2,600
Per month		*31,700* tons.

B.S. WATCH SQUADRON.

2aC	2 × 3,300	6,600
$2C_2$	2 × 2.100	4,200
$1C_3$	1 × 900	900
6D	6 × 515	3,090
Per month		*14,790.* tons.

COAL RESERVE (PROPOSED) AT MALTA AND GIBRALTAR.

GIBRALTAR.

Fleet.	Supply.	Tons.
Anti-Toulon	3 months 60,500	181,500
Anti-Brest	2 „ 50,300	100,600
Toulon Watch Squadron ...	3 „ 17,600	52,800
Anti-B.S.	1 month 31,700	31,700
Total		*366,600.*

MALTA.

Anti-B.S.	3 months	95,100
B.S. Watch Squadron ...	3 „ 14,800	44,400
Anti-Toulon	1 month	60,500
Anti-Brest	1 „	50,300
Toulon Watch	1 „	17,600
Total		*267,900*

War Coal at Gibraltar[1] ... ... 370,000 tons.
„ *Malta*... ... ... 270,000 „

BASE STRATEGY.

Base Strategy does not require a very lengthy description. It consists in keeping in close touch with a naval base, waiting for an opportunity to strike, and has the following advantages:—

Repairs can be quickly executed.
Fleet can be kept full up with coal.
Latest central news is immediately known.

It is a policy which keeps the fleet in a high state of mechanical and coal efficiency.

[1] Minimum required.

COAST DEFENCE
FROM AN IMPERIAL STANDPOINT.

By Colonel E. W. COTTER, h.p., R.E.

Wednesday, 17th February, 1904.

Major-General Sir HUGH MACCALMONT, K.C.B., in the Chair.

IN a lecture limited in duration to one hour it would be impossible to treat the subject of Coast Defence in detail; I therefore confine myself first to a general outline of the principles on which, in my opinion, coast defence should be based, and follow with an illustration of the application of those principles.

A statesman has recently told us that he could never get an answer to the question: "What is the object of the British Army?" At last we seem to be agreed that to answer the question correctly it is necessary to study our whole Imperial position. Only when we have done that can we arrive at a sound decision as to the size and constitution, not merely of our Army, but of all the Services connected with national defence.

I asked myself, "What is the object of coast defence, what should be its nature, and what its extent?" and I came to the conclusion that, like the rest of the Services connected with national defence, it should be treated on the broadest lines, because its object, nature and extent will depend on the relative power of our Navy, and the objects for which that Navy exists.

My argument is as follows:—

1. It is of vital importance to us to have command of the sea, in order to keep open our Imperial communications and protect our seaborne trade. If we fail in that we fail in all, and coast defence would be worthless.
2. As we must keep command of the sea, we do not require coast defence to protect us from invasion by a large Army; the utmost that we need fear is raiding by small forces, which can most cheaply be met by placing small mobile garrisons near such points as are of sufficient importance to tempt a raid.
3. In order to keep command of the sea, it is necessary to secure permanently throughout a war those harbours whence our Navy draws its ships, its men, and its stores, and, in order to give freedom to our seaborne trade, it is necessary to secure our principal commercial ports.

4. If we relied on our sea-going fleets to secure permanently the safety of our naval bases and our chief commercial ports, it would be necessary to have, within striking distance of each such place, a fleet equal to the whole fleet of the enemy in being at each period of a war—a wholly impossible idea.

5. It *is* possible to secure the harbours by defences placed on or based on the land, without inordinate expense.

The first four points I consider truisms which require merely to be stated; the last point, however, requires to be supported.

The truth of the point depends on two main reasons. First: In order to secure our harbours by land defences, it is not necessary to have anything like the power which would be required if we relied solely on a fleet, because the land defences need only have sufficient power to ensure that an enemy will suffer more loss in getting possession of the harbour than we will suffer by losing possession. The strength of the coast defence of a country like ours, which has to retain command of the sea, does not depend on the strength of its weakest defended port; it is sufficient to defend each port relatively to its importance. As far as I know, this theorem, on which all our coast defences should be based, has never before been publicly formulated; but common-sense has brought about nearly the required result, for we have never fortified unimportant places as heavily as places of more importance. None the less, I think it is of manifest advantage that the principle and the reason for it should be enunciated. The theorem does not apply to defence by a fleet, because the very existence of that fleet would induce a superior inimical fleet to attack and destroy it, after which the port, if not otherwise defended, would be at the enemy's mercy.

The second reason in favour of the altogether greater economy of coast defence as compared with defence by a fleet is the fact that not only do we require less power, but that this lesser power can be obtained on land at far less expenditure in men and money.

Apart from the axiomatic reasons that on the land you have not to build expensive vessels to float your works, there is a reason which requires argument in support.

Within its arc of fire, one gun on land was always superior to one gun on a ship, owing to its stable platform, and the fact that such platform could not be sunk. I make the reservation contained in the words, "within its arc of fire," because the ship, being mobile, could sometimes place itself outside the arc of fire of the guns of the defence and yet bring its broadside to bear on them; but this advantage usually existed when short lines of defence were dealt with; against long lines it should have been rarely possible.

The often expressed view that in smooth-bore days, ships were superior to shore batteries arose from forgetting that success was almost invariably due to superiority in number of guns. People knew, but did not realise that even two-deckers had an average of about 70 guns apiece, so that, counting even but one side, three sail of the line had a broadside of over 100 guns. Did anyone ever hear of a line of batteries, having 100 guns on the water front, being reduced by three ships; or of any important case where the relative number of guns available were in similar proportions?

In those days ships had greatly concentrated gun power, which, when they could lie close to a low battery, enabled them to overwhelm the defence by sweeping the parapets or pouring projectiles through the embrasures; but this concentration of power could have been given to the shore batteries quite easily. It was not often given, because open earthworks were so much cheaper.

Whenever it was possible to defend navigable waters by placing guns at a high level, then the land gun entirely dominated the gun on the ship. As the ship had to lie off at least as far as to enable its own guns to hit the battery, it was no longer possible for it to sweep clear even open earthworks. Hits on the ramparts inflicted little or no damage; to effect anything a gun or an individual man had to be hit directly, not an easy thing at some distance with inaccurate smooth-bore guns fired from an unstable platform; while the land gun had still a target it could not miss, for every hit on the ship was effective. A consequence of these facts was that, at high levels, it was no longer necessary to shelter land guns by placing them behind the parapets and making them fire through embrasures; but they could be placed *en barbette*, thus largely increasing their arcs of fire, and rendering it rarely possible for a ship to take up a position whence it could hit the battery without being hit back. In the well-known case of the naval attack on Sebastopol, the Wasp and Telegraph batteries, which were 115 feet above water, beat off with their ten guns of which they lost but one, two of our ships, mounting altogether 140 guns, say 70 on the broadside, and then caused the abandonment of the whole attack.

The introduction of rifling increased the advantage of the land gun, because fighting could commence at longer ranges, because the increased length of effective range enabled a channel to be defended from a larger choice of positions, and because the increased accuracy of the gun could be more fully taken advantage of from a stable platform. All these advantages increased as the range and accuracy of rifled guns increased after their first introduction.

The invention of automatic sights, which require a stable platform, has once more favoured the land gun, where high positions are available. The principle of the automatic sight can be illustrated by Fig. 1.

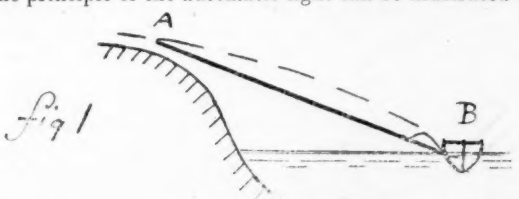


Fig 1

Assume a gun at A and a target at B, then the line A B is the line of sight. If you know the height of A above water and know the depression of the line of sight, you know the range. If, then, you can arrange that as the sights move vertically the gun will move simultaneously in such a way as always to have the elevation above the line of sight corresponding to the range, then the gun layer has but to bring his sights to bear and, without estimating the range, or waiting to have the range passed to him, or, in either case, having to alter his sights to suit the range, his gun has the proper elevation.

The principle was, of course, always known, the difficulty was to apply it, for it demanded not merely separate sighting gear for each

pattern gun, but for each pattern at every different height above water. It also demanded almost perfect mechanism in the mountings, and almost perfect accuracy in the laying of the platform. But when quick-firing mountings and rapid loading arrangements were invented, the advantage of having some quick method of aiming became strongly apparent, and, owing to the development of mechanical engineering, the problem was solved, in large measure by Sir George Clarke, whose name now looms so largely before the public.

Such is the theory of automatic sighting; how about the practice? I am not a gunnery expert; but I have seen practice with both the old and the new sights, and can say that when I first saw practice with the latter I was literally astonished. With sufficient height relatively to the range, I thought the efficiency of the firing was at least doubled.

Theoretically, of course, automatic sighting is accurate from any height above the water; but, like all things made by man, it is in practice liable to error. When the angle of depression of the line of sight is very small then a small error in sighting will cause a large error in range, and as a result, fire with the ordinary sights, though slower, might be more effective; hence the necessity for height if the advantages of the sights are to be properly utilised. I am not prepared to lay down a law—I leave that to some gunnery expert—but as an indication to those present who would like to have some idea of the matter I can state that from a height of 60 feet with medium guns good practice can be made with automatic sights up to a range of a mile and a half. From a height of 240 feet the range might be about three miles. Realise then the advantage of being able to follow the ship through your sighting telescope always having the range, and always ready to fire when the gun is loaded, and you will have a good idea of the position.

From the foregoing series of arguments, I submit that I may thus sum up my case so far as it has gone. That coast defence with us must be wholly subsidiary to naval requirements, using the word "naval" to cover both our war and mercantile marine; that coast defence resolves itself in our case to harbour defence; that though we must have command of the sea we cannot rely on having that command everywhere at the same time throughout a war without intolerable expense, and that hence some cheaper form of securing our naval bases and our principal commercial harbours than defence by fleets is necessary; and, finally, that this coast defence can be provided without extravagance by land works because at each harbour it is only necessary to provide defensive power proportionate to the importance of that harbour and because such power as is required can be provided on land incomparably cheaper than on the water.

Having stated the principles on which I think our coast defences should be based, I will give an illustration of the method in which they might be carried out in an imaginary case, indicating how at almost every step our two great Imperial interests, naval supremacy and freedom of commerce, should guide our arrangements.

Let us consider the case of an imaginary harbour, with two entrances, to illustrate an important point. See sketch, p. 517.

It can be readily understood that a simple way of defending a harbour is to block it altogether against entrance, as the Russians did at Sebastopol; but that if we have to afford free ingress and egress

to our friends and deny them to our foes, the problem requires more complicated and more expensive arrangements.

With us, harbour defence must be entirely subsidiary to the interests of our war and mercantile marine, and hence we cannot adopt the cheap passive defence except where a harbour has two entrances, when possibly it might be admissible to adopt that form at one entrance. If this be done it should be no secret; the fact should be publicly announced.

In the case we are considering, I assume that one entrance may be closed to both friend and foe. As the navigation of the western entrance is easier than that of the eastern, I choose it as the one to be kept open, thus sacrificing the purely defensive view to the requirements of our own ships. A nation with a weaker Navy and less dependence on its seaborne trade might very well reverse the procedure. At the western entrance every step taken must be subsidiary to the necessity for affording reasonably free passage to our own ships.

I assume that the harbour has importance on the whole equal to that of Plymouth, which has an important dockyard on its shores.

The accompanying sketch will enable those who are not experts to realise what I mean when I use the term "combined arc of fire." The figure represents a ground plan of a battery.

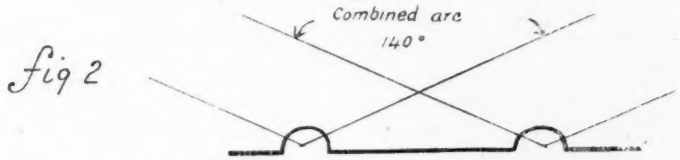


Fig 2

From a centre on the right front there are two lines drawn, making an angle of 140° between them, and a similar pair of lines on the left front. These lines represent the limits of the arcs of fire of guns pivoting on each centre respectively. The inner lines cross in the centre, making again an angle of 140°. Now, the outer area beyond the crossing enclosed between these two lines is within the combined arc of fire, that is to say, that, as in Q.F. batteries, the gun on the right may not fire within 20° of the direction of the one on the left and *vice versâ*, only the area I have just defined is under the fire of both guns.

It is not considered admissible to place Q.F. guns closer than 40 feet apart. My own opinion is that the distance should not, except for strong reasons, be less than 50 feet, on account of the effect of noise and blast from a gun fired so nearly in one's direction as 20°, because, though small, they are rapid-firing guns. With medium guns the distance apart is 100 feet, and with heavy guns 150 feet, and as both heavy and medium guns may not fire within 30° of the direction of an adjoining gun, the combined arcs of fire are reduced to 120°.

I have described these arrangements in some detail because I would like to add an opinion to the effect that though the distances suffice when a detachment has only one gun other than its own in the same group, they do not suffice when there is a gun hammering away at each side. I would like to see all guns in groups of two, and, when there is more than one group on the same terreplein and on the same

general front, I would give spaces between groups at least 50 per cent. greater than the interval between the guns of each group.

To return now to my harbour, I will deal mainly with the western entrance, which, as it has to be kept open, is the more important.

The line A B indicates the ordinary course of navigation taken by ships entering the harbour. In our case it would be wrong to alter or interfere with freedom of navigation along that line; it should be kept well clear of obstruction and no defence light so powerful as to dazzle the eyes of pilots should be allowed to shine too directly along it.

The necessity for giving freedom of navigation to our own ships raises the question of distinguishing friend from foe. It is a very difficult question.

Some years ago, during naval manœuvres, I commanded at a defended harbour, my main duty being to try a method of meeting the difficulty. The method was found too complicated, and has been abandoned. Though I may not even now describe the method tried, I should like to say something about what took place.

On two occasions the defence gunners fired on ships belonging to our own side, and a special correspondent of the *Times* wrote a series of diatribes against the military on the strength of a signal which had been communicated to him. I wrote shortly in reply to the effect that as the instructions governing the entrance into defended harbours in time of war were strictly confidential, the correspondent could not know what he was writing about. I did not then add, what I now can, as the system has been abandoned, that the correspondent's ignorance was so complete that the answer to his diatribes was contained in the very signal which he took as the foundation for them.

The correspondent's letter started off a host of self-constituted authorities. One original person said that no matter who was to blame it would be little satisfaction to the nation if it lost two of its own ships in time of war. Good heavens, what on earth were we doing but trying a method of preventing that, and how could we try the method if we did not rigidly adhere to its instructions? Did the man really think that our gunners are to recognise all our own ships even in the dark, and pass them whether they comply with the regulations or not? Please understand that I am not saying who failed. That is not necessary in this case, for the writer said it did not matter who was to blame.

Another individual of the same class took up the text. I must mention one of his charges, as it is instructive. In the course of pointing out that our methods of coast defence in some ways were foolish, inasmuch as they were more injurious than advantageous, he said that it was our practice to disregard the necessities of our own ships and sometimes threw powerful search-lights in the eyes of navigators so that they could not steer. Such may have been done in making trials; but so little truth is there in the charge that I need only answer that, for upwards of seven years at least, no defence light has been permanently installed without the Board of Trade being first informed of the position of the light and the direction in which it is intended to shine, and permission obtained for erection.

Lieut.-Colonel Maude, lecturing recently at Aldershot, condemned the scurrility with which the officers of our Regular Army were attacked by many special correspondents during the recent war. Though it is

often the privilege of "Our Own" to be wise after the event, how very wrong he often is even when he has that privilege. Their very profession induces among gentlemen of the Press an effort at omniscience, with the consequent tendencies to dogmatic judgment on matters of opinion, and pretence at knowledge when they don't know.

I have said that the system tried was abandoned. I do not know what the present system is; all I know is that it is something very unlike the one tried by me. But I must give a general idea of what, in my opinion, must be included in any system in order to show how it governs the whole scheme of defence against large ships.

Near the mouth of every defended harbour there would be a war signal station. So far from trying to keep its position secret, I would during peace publicly announce the position in which it would be placed. The duty of this signal station would be to communicate with every ship approaching the harbour. Everything secret in the way of communication would be here carried out. If the replies of the ship were satisfactory, it would be given permission to keep on its course; if not, the batteries would be informed so as to fire at or to warn off the ship. It follows that batteries should be placed so as to command as far as possible the whole area within the purview of the signal station. Merely to give satisfactory answers to the signal station ought not to give complete entrance; it should only allow vessels to enter an area wherein they can be boarded and examined. As the weather would often prevent this being done in the open sea, the examination area must be fairly sheltered. The inner limit of this area, which should, in my view, be made publicly known for every defended port during peace should be a line with a definite bearing from some point which is marked on all charts. Ships crossing the line without authorisation would be fired on. Manifestly, to guard against a ruse, strong defences should exist to cover some area behind this line.[1]

Whatever the system adopted, I can say with absolute conviction that all the arrangements governing the entrance to defended ports in time of war should be in charge of the Royal Navy. The Army should have nothing to do with them, except when informed by the Navy to fire at an inimical or warn off a doubtful ship. One great point is that the regulations should be so clear and so well known that friendly vessels can make no mistake.

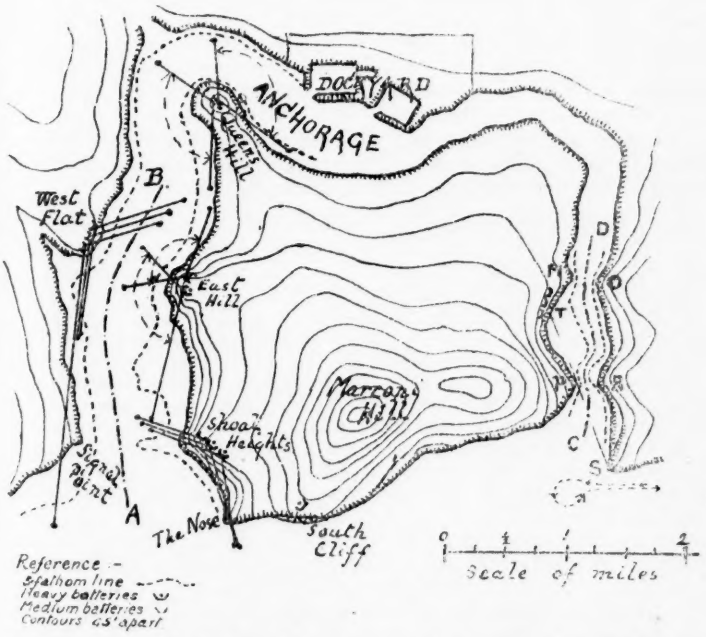
Now, as to the application of this system to the harbour we are considering. I place the signal station on Signal Point, which I prefer to Marconi Hill, which is often enveloped in mist; besides we want the closest inspection. As to the examination area, mere inspection of the plan indicates that the narrow part between West Flat and East Hill is capable of strong defence, while outside it is a fairly well sheltered area. I therefore assume that the Navy would be asked to fix a well-defined line across the channel, a little distance below the narrows, so as to give time to the defence, and yet not so far down as to unduly limit the area in which the examination will take place.

The point I have now reached is a good one for discussing the question of a mine-field. Whether a mine-field is to be placed or not is purely a naval question. If not provided, the gun defence must be stronger. In this case I assume that it will be provided, and naturally

[1] It must not be thought that this forms a complete scheme, it is only a portion of a scheme; there would necessarily be many other regulations.

place it across the narrow part. Again you may ask—Will our own ships run risks? Practically none. I am divulging no secret when I say that no nation dreams of using mines which explode on *mere* contact; if they did, there would be many cases of the sapper being hoist with his own petard. Contact mines are more dangerous to friend than foe—the latter may not come near them, the former would have a ticklish job in laying and removing them. All mines are fired by an act either as deliberate or nearly as deliberate as firing a gun. But there are objections in our case to a continuous minefield. The main ones are that our own ships passing

IMAGINARY HARBOUR.



in and out would damage the mines and their connections, while the cables might entangle the screws of passing vessels. For these and other minor reasons we should have a friendly passage through the minefield along the ordinary course of navigation. The width of that passage should be fixed by the Navy and the Board of Trade, but I can conceive no case when it would be necessary to make it more than 300 yards wide. In the case in point, its sides might be 150 yards at either side of the line A B, in which case, as the channel at the narrows is about 1,200 yards wide, three-fourths of it would be absolutely barred to big ships, and only be passable to torpedo-boats if they were prepared to sacrifice, not merely the leaders, but a second and possibly a third line as well, a loss that would probably act as a strong deterrent.

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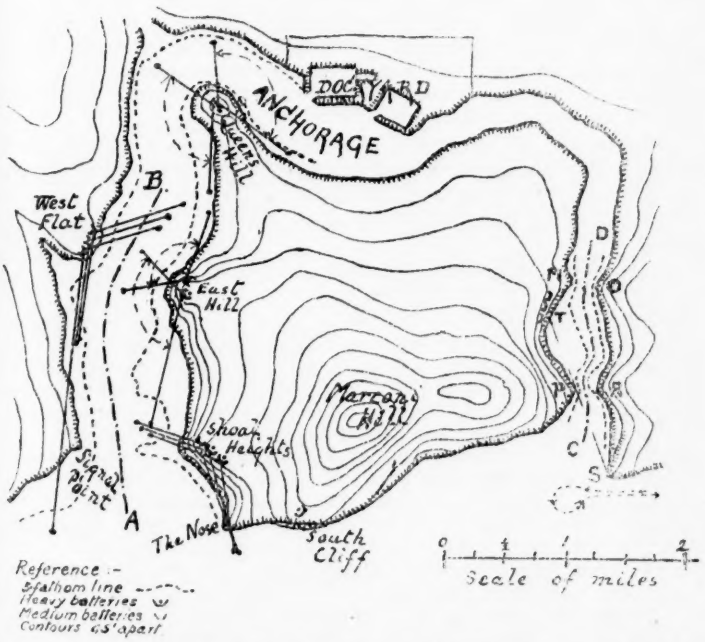

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But as regards torpedo-boats, we want to be "sure"; probable safety is not sufficient. We may not interfere with the friendly channel, but surely we can anchor booms behind the two minefields, along the line between the north corners of East Hill and West Flat. As the channel is 1,200 yards across, and the friendly channel 300 yards wide, this would mean two booms, one about 500 yards, and the other about 400 yards long. Such booms would so back up the minefield that we could say with absolute certainty that no torpedo-boats could get in except through the friendly channel. The booms would have an incidental advantage, because they would force bargees and such like truculent navigators to keep clear of the minefield, which they might otherwise damage in passing.

I read the other day a review of an American book on Coast Defence, from which I gathered that the author proposed to place a minefield out to sea in front of the entrance. This seems to me an extravagant proposal in any case, but also an inefficient one, for in such a position the mines would be exceptionally liable to damage, and there would be great difficulty in repair. At any rate, such a proposal is utterly unsuitable to our conditions.

I have now prepared the way for a description of the gun defence. This divides itself into anti-torpedo-boat defence, to which I barely allude to-day, and defence against large ships:

Defence against large ships is divisible into three, though all three overlap:—

1. The outer defence.
2. Defence of the channel.
3. Defence of inner waters.

The object of the outer defence is to keep the enemy well off the port and cover the area overlooked by the signal station. The sketch sufficiently indicates the area covered by the guns, which have their full arcs of 120° to the open sea, and which can all be brought to bear on ships making the entrance, while the right-hand guns of each battery can follow an enemy for varying distances up the channel. The two outer batteries have each two heavy guns; the inner one two medium guns. It will be noticed that the point called "The Nose" defilades the batteries from any position whence they might be attacked without all the guns being able to reply; that is to say, all the area from which the batteries can be seen is within the combined arc of fire. The sites are high.

To defend the channel from the mouth inwards I naturally select the narrows. As the outer edge of the plateau called West Flat makes an angle of nearly 30° with the direction of Signal Point, it can be arranged for all the guns to cover the channel right round from Signal Point as far as the combined arc of 120° will permit. Included in this arc are the whole of the narrows, so that the weak point—the friendly channel—is under a powerful fire. Though the height of the guns is only 60 feet, it is enough to allow the use of automatic sights at all ranges inside the entrance; in fact, just where they would be most useful. As Signal Point is not high enough to hide the batteries from the sea, it is advisable to throw back the line a bit so as to give fire over the point, but I would not do that at the sacrifice of a single portion of the fire over the friendly channel; especially as ships trying to enfilade the batteries from a position

whence their fire could not be returned by all the guns they were firing at would, at any rate, be under fire of the right-hand gun of the right battery, besides the fire of the guns on Shoal Heights. I think three batteries of two medium guns each will suffice for this site. It can be seen that all the guns include in their total arc of fire an arc of about 50° to the open sea, which enables them to strengthen the outer defence.

Though East Hill is not so suitable for a line of batteries defending the entrance, one can place on it batteries with different fronts. My design is a battery of two heavy guns with an arc of fire that covers the deeper part of the entrance and the open sea beyond, through an arc of 25°, and continues to the right till it includes the friendly channel underneath. I arm this battery with heavy guns, so as fully to take advantage of the height of the hill. Further in I place on the same hill a battery of two medium guns which, while including the friendly channel within their arc of fire, cover with the rest of it an area inwards and not outwards. This brings me to third section of the gun defence, namely, that of inner waters.

I know that high naval and military authorities are opposed to this class of defence, but I know that equally high authorities of both Services are in favour of it. It is a question which should be thoroughly examined and settled. Its object cannot be defence against large battle-ships or cruisers, for no admiral would be mad enough to send ships costing a million of money, and taking from two to three years to build, to rush a channel defended by mines and heavy guns, knowing that after they have got in they have to get out again, if they are not to be lost to him. This class of defence cannot be meant against torpedo-boats for, as they would invariably attack at night, they could not be seen, for who would think of lighting up waters in which his own ships were at anchor? I have sought for an object, and think it can only be that, prior to declaration of war, an enemy might open the ball by sending ships of little value to destroy peaceful shipping lying in the harbour, and to blow up dock gates and do as much such-like damage as possible till they are sunk.

To resist this class of warfare perhaps medium guns would suffice. In the case in point the battery on East Hill, which assists in defending the friendly channel, might cover, as shown, the reach inwards. On Queen's Hill two more guns with an all-round fire could be placed. The combined arc outwards includes raking the narrows, while the inward arc covers the anchorage and the waters off the dockyard.

A better way of meeting a raid made by large ships before declaration of war is to prevent the enemy from getting in by taking the necessary steps when war seems imminent. Supposing the Navy were not prepared to prevent such a raid at all harbours, and that the one under consideration required to be protected by the land service, I would recommend that the whole or part of the regulations governing entrance should be introduced in good time, and then rely on dirigible torpedoes. A dirigible torpedo will certainly sink a ship attempting to rush a channel, unless the navigable portion be over a mile from the torpedo installation. Now, supposing that the mine-field has not yet been laid, and that the artillery garrison has not yet been brought up to war strength, still, if the torpedo installation be ready, and be large enough to allow, say, three torpedoes to be fired in succession, I think such a raid would fail.

I have said that gun defence of inner waters cannot be intended to destroy torpedo-boats. If a raid by a number of these little craft were made before we were ready with our full anti-torpedo-boat defence, I don't see how to stop it; at any rate, it cannot be done by the land service. In my opinion, dirigible torpedoes are of little value against a mosquito fleet; to use them thus would be like firing cannon balls against a line of skirmishers. The lesson seems to be: "Get ready to meet a torpedo-boat attack immediately war seems probable."

Looking at such a defence as I have described, you will observe that consideration of our own naval requirements has been my guide throughout.

"What!" it may be said, "you consider eighteen heavy and medium guns sufficient to defend such a harbour with an importance equal to Plymouth?" My answer is Yes, in combination with a minefield covering three-fourths of the narrows and a dirigible torpedo installation capable of firing three torpedoes in rapid succession. Recollect that I have hitherto been dealing with an attack by a fleet, not with a raid by torpedo-boats, for such require separate treatment. I believe such a defence as I have indicated, if it did not beat off an attack *à outrance* by a large fleet, would inflict such damage on it before succumbing that all the damage the victors could inflict inside would not repay them. Realise that the victors cannot land to any extent, for riflemen could shoot down the landing parties, and every defended harbour will have an infantry garrison. The main damage the ships could do would have to be done by torpedoes and by shell fire. It dare not do much of that sort of thing, else it would be at the mercy of the first battle-ships of ours with full magazines that arrived on the scene. I say that no attack by a fleet alone is likely to be made on such a port under any circumstances; and to expect it, when the enemy can only have temporarily command of the sea at this point, is to give him credit for folly—folly which we should be glad for him to commit.

Then why defend it so strongly? Because I may be wrong, and the expense involved is not great, and, moreover, it may be considered desirable to dispense with the minefield at one time or other. One should not be too cocksure. Many high military authorities thought one army corps with the Indian division and such troops as were in South Africa in October, 1899, would suffice to conquer the Boer Republics. I confess I thought so, too. Well, we lived to see the equivalent of six army corps carrying on the war for many months.

Should it be thought that more should be done, I would put a battery of heavy guns on South Cliff, where shown, which could join in the defence of the western entrance and prevent a ship circling off the eastern in the manner indicated by the dotted lines.

Time prevents me from dealing with the question of torpedo-boat raids, but the details of such would not materially help to illustrate the matter looked at from an Imperial standpoint. I desire, however, to indicate a few general points.

The defence lights which should steadily illuminate the outer area should emanate from East Hill. If they were placed on West Flat the one that looked due south would shine directly along the line A B, which would interfere with the free navigation of the entrance.

Another point, and one of vast importance, is this: I have laid stress on the enormous cost of modern men-of-war, and the time it takes to replace a lost one, and indicated how little likely an admiral would be to waste them against land works. For precisely the same reason how necessary it is to protect these valuable machines from being destroyed by a mosquito fleet. What a prize for torpedo-boats if a raid by, say, twenty or thirty of them, managed to sink three or four battle-ships; what matter if all the boats were lost, it would still be a victory.

Just as I think that we overdo our defence by heavy guns, so I think we are apt to underdo defence against torpedo-boat raids. While I think few will support me in thinking such a defence against large vessels as that I have indicated would suffice if the harbour were as important a commercial port and naval base as Plymouth, I believe that the anti-torpedo-boat defence which I would recommend would be scouted as altogether overdone.[1]

When I settled that the eastern entrance was to be blocked, but little of importance from a national standpoint was left to say concerning it. Suffice it to say that I would cover about half the basin with mines from the narrows at M O southwards, that across M O I would place an exceptionally strong boom, and to prevent armoured boats from coming in to destroy the obstructions I would have four medium guns. For night work I would have simply one search-light placed at T, where it would be defiladed from the open. As it would not have to carry far I would give it a 30° splay, so that it could light up a considerable area at the same time. Against a torpedo-boat raid, if such madness were attempted, I would assist the heavier guns with four quick-firing guns. I would place the medium batteries to the left of the light, so as to cover any position whence the light could be hit, with the quick-firing guns to the right of the light.

In case it were considered desirable to make arrangements, while denying entrance to *all* vessels, to allow egress to our own torpedo-boats, the matter would scarcely be altered, for the consequent passage through the minefield need only be thirty yards wide, and, if commencing at a movable portion of the boom near O, and directed in a S.W. course on leading lights inside P, there would be but little loss in defensive power. Even if egress for large ships were required, and, in consequence, a wider and more direct friendly channel became necessary, the only changes I would make would be to light up the whole basin and double the number of Q.F. guns. The defence would be assisted by a battery placed on South Cliff, before referred to, for it would prevent a ship from circling off the entrance and making practice by firing at the boom and the minefield, while avoiding the guns of the defence.

In the early part of this paper I said that it is only necessary to defend a harbour relatively to its importance. Suppose my imaginary harbour, instead of having the almost constant value of Plymouth, were to be a mere coaling station for the fleet, then how different its value, according as a fleet is anchored inside or not.

[1] These two paragraphs were written and handed in to the Editor, R.U.S.I. JOURNAL, before the news of the outbreak of war arrived. Since then no word has been altered.

In such a case, what value should be put on the harbour when deciding on the strength of the land defence?

Here again the question of defence against large vessels and against a mosquito fleet must be kept separate.

As regards defence against large vessels, I would merely rank the port at the largest non-effective value that it is likely to have inside, including under the head of non-effective not merely colliers, store-ships, and merchantmen, but also an allowance for ships of war temporarily out of action. I would add nothing on account of effective fighting ships, because, just as they add to the value of what is inside, they also add to the defensive power.

Against torpedo-boat raids the matter is altogether different. If the harbour be within striking distance by torpedo-boats of any foreign port, then, if the harbour be likely to have a fleet anchored inside for any considerable period, the anti-torpedo-boat defence should be nearly as strong as if the harbour had the importance of Plymouth, because in neither case should torpedo-boats be allowed to get in. I say *nearly as strong*, because a fleet while inside could lay down a minefield and a boom, or add these defences to such smaller minefield as may be considered sufficient for the ordinary case of the harbour. Here again it is a question for the Royal Navy to settle: How much extra will they be prepared to do in such a case, and, consequently, how much shall be done by the military? Please note carefully that in saying "nearly as strong," I only include mines and booms, for in both contrasted cases the number of defence lights and the number of Q.F. guns should be precisely the same.

In concluding my paper, I would ask whether the time has not come for handing Coast Defence over to the Royal Navy. As it is entirely subsidiary to naval considerations, why bring in division of responsibility, especially as such division is most acute at the very place where there is most difficulty, viz., at the entrance? Such a proposal does not mean abolition of our Fortress Artillery or Fortress Engineers, it merely means that those bodies would be included with the Corps of Royal Marines. In every large fortress the whole defence on the sea front would be in charge of the Navy, that on the land side of the Army, the duty of the governor of the fortress being to make them perform their separate duties for the common end. Such a division of duties and separation of responsibility seems to be simpler and more logical than a system which involves joint responsibility, first, for every question connected with the principles on which the defence should be based, where naval considerations alone should be paramount; and, secondly, joint responsibility at the very place where mistakes are most likely to occur.

Admiral F. Arden Close:—Permit me to thank the lecturer for the information he has given us. If there is a fault to find in the lecture, I would say it is rather more scientific than practical, for this reason: Submarine mines are unreliable, and are useless against disguised gun-boats. We have recently had an instance of self-destruction, by a ship being blown up in the face of the enemy while trying to lay mines at Port Arthur. I hoped that as a Royal Engineer was to give us a lecture on coast defence, we should hear what was ready for the defence of the coast. The meeting may remember that in years gone by schemes were proposed by foreign officers for the invasion of this country, and at the head of that list always appeared the Bristol Channel. I made it

my business to look after those defences, and found that they consisted of two fortified islands called Flatholmes and Steepholmes, with a battery called Brean Down to correspond with it on the mainland. The guns were old and almost useless, and there were no gunners or garrison; nothing ready for immediate defence. The mayor and people of Bristol petitioned the Government that the coast defences of the Bristol Channel should be reorganised. We have now a gun-boat, Naval Volunteers, and six new batteries. That leads up to a question I wish to put to the lecturer: Do you, in constructing these maritime forts, seek the advice of naval officers? I do not mean the naval officer stationed at the War Office; but whether a naval officer goes down to these maritime forts, and sees that they are constructed not only theoretically but practically? Without the assistance of a naval officer no maritime fort can be as serviceable as it should be. The other question I wish to ask is: Are our maritime forts ready? Because if they are not ready, what is the use of them? as war will come upon us like a flash of lightning. Again, take the Thames—another weak point in our defences. As I stood on the banks of the river at Tilbury and saw the enormous number of merchant-ships flying by on the flood tide, I asked myself: How are we going to stop this? Any one of these ships might have a charge of dynamite on board; any one might be a gun-boat in disguise. I wrote a letter to the *Globe*, and the Editor was pleased to put a heading: "London bombarded; London in flames!" Two powerful forts have since been built between Tilbury and Sheerness. London is now safe from general attack; but if Germany was to declare war on Monday morning, they could have a couple of disguised gun-boats up in the middle of London by the next night. These maritime forts have no means of knowing the difference between a friend and a foe under false colours, and when it comes to disguising gun-boats to make them look like a merchant-ship and under false colours, they would not be interfered with at all. I say that London will never be safe until we always have a couple of gun-boats stationed there, because at the present moment if gun-boats got up past Tilbury to London, there is nothing to meet them but a police-boat; there is no knowing what havoc the gun-boats might do. They might blow up the bridges, destroy the Houses of Parliament and the docks and shipping; also Woolwich Arsenal and the magazines at Purfleet. Londoners do not understand that London is no longer an inland town, and is as much exposed to attack in these days of steam power as Hull, Liverpool, or Glasgow. London is under military protection, and as it is impossible for them to perfect that protection without the assistance of the Navy, I submit they should ask for that assistance now, not waiting for the outbreak of war.

Colonel R. F. Johnson, C.M.G., R.A.:—I happen to have been the Artillery officer in charge of the Severn defences for two years, and I am happy to say that while I was there there was no insubordination nor drunkenness, and the forts were perfectly ready for action. I cannot say that it would have been much good to man them, because at that time the guns had not been replaced by new ones; but with regard to manning them, we had a most excellent and very strong corps of Volunteer Artillery in Cardiff, within half-an-hour of the nearest fort, and within two hours of the farthest fort. The men were perfectly trained with all the guns that were in those forts. The lecturer has given us an example of the application of what he considers are the principles of coast defence. My practical experience makes me afraid of principles when they are applied

to such matters. It was principles that led to several of our home ports being fortified on a scale calculated for a total of garrisons amounting to 67,000 men. The principles that have led to the conclusion that the heavy land defences of some of these forts are not necessary, have caused those of others, whose conditions are entirely different, to receive insufficient attention. The adoption of principles in placing guns has in some instances prevented the best use of the available sites. I know a work in which the changes in the conditions attaching to ships has made it desirable to alter the direction of the "combined arc of fire." When I discussed this with an Engineer officer I was told it could not be done, because the site did not admit of its being so, and of retaining the regulation distance between the guns. We did not want the arc of fire to be near the guns. Where we wanted a combined arc of fire was a considerable distance off, so that the blast need not have been taken into account. The principle, which in itself is perfectly correct, that high sites enable better practice at targets from cheaper works, has prevented the use of low ones, which from their proximity to the channels that must be used by ships would enable us to make use of the greatest power of our guns, if they were armoured and protected in the way those on the ships are, which is our only chance of denying the passage to a determined assailant. I entirely agree with the lecturer when he says that a harbour with an importance equal to Plymouth may be sufficiently defended by 18 heavy and medium guns; but whether Plymouth could be defended by that number is quite another matter. If the guns were of sufficient power, properly placed, and sufficiently protected, even a smaller number might suffice. And it is especially necessary to limit your armament and fortifications nowadays, because it is more important than ever that they should be just as ready in every way, including their garrisons, for action as the ships that they have to fight. The only principles that I can accept with regard to coast defences are that they shall be strictly confined to places where the Navy thinks them necessary, and that their extent and cost shall be as small as the local conditions, strategical and tactical, admit. I am sure that there might be a great saving made in the annual cost of our sea fortresses, though possibly a considerable capital expenditure might be necessary to enable this to be done. Whether you should defend the entrances or the inner waters of a harbour depends on the strategical conditions, on what damage to that which you are defending is worth to the enemy, and on what he can afford to pay. Can anyone cite an instance of batteries stopping completely the passage of a channel? If such an instance can be given, it is certainly the exception that proves the rule, and the chances of armoured ships getting through are now better than they have ever been. Suppose Port Arthur contained the only Russian dock in the Far East; suppose that the Japanese Fleet had either a ship or two to spare, or was too weak to meet the Russian Fleet in battle; then, if the Russian Fleet was elsewhere, would it not in either case be worth while for the Japanese, whether in decided superiority or decided inferiority, to risk the loss of a ship or two, if the absence of inner defences gave them the chance of destroying the dock? It seems to me somewhat lost sight of, that in defending channels by guns, and more so by mines, there is, in not a few localities, a danger of blocking with the sunken ships the channels it must be your object to keep open. I am entirely opposed to the proposal to hand over coast defence to the Royal Navy. The proposal is tempting to a Garrison Artilleryman, for in the work of defence the Navy must have more interest than the Field Army. We should get more money for the adjuncts

necessary to develop the full powers of our armament; we might get rid of the principles of fortification, but the corps would suffer a deadly injury in having its chances of active service reduced to almost nothing, and the disadvantages to the Navy would be out of all proportion to any possible gain. All naval energies should be directed to offensive action; and, with our Constitution, it is necessary that the Naval Estimates shall not be burdened with any expenditure not required for that offensive action. A Coast Defence Corps, entrusted with both the designing and fighting of the defences both seaward and landward, maintained on separate estimates, and at some places largely composed of partially-paid local troops, might perhaps be an improvement on our present organisation; but that is a large matter on which I should be sorry to be asked to give a decided opinion, for though the idea meets some views worthy of consideration, it has the great objection of locking up large numbers of men and officers, and in such a way as to lower their *moral* and zeal.

Lieut.-Colonel F. G. Cotter, R.M.L.I. :—It is only with reference to the last paragraph of the lecture that I rise on this occasion, because on such a highly technical lecture that we have just heard it would be absurd for me to make any comments on the details. There was one matter with reference to the defensive arrangements that struck me—and always strikes me—as a weak point, and that is the defence lights. It appears to me to be essentially a very vulnerable point, especially at night time, when of course their location is at once seen, and would be the object of raiding parties landed on various parts of the coast, and also open to attack from quick-firing guns carried by destroyers. I have heard it said that you cannot aim a gun at an electric search-light; but that is not my experience. I say you can aim a gun at an electric search-light, and probably hit it, too. If the search-lights in the harbours like Plymouth or on the Thames were destroyed at night, what is to prevent torpedo-boats coming up the very next night? That is all I wish to say with reference to defence. The only other matter I desire to refer to is the last paragraph in the lecture, namely, the proposition to hand over the fortress defence to the Navy. The author mentioned the Royal Marines as being the soldier body of the Navy, and suggested that the Fortress Artillery and Engineers should be, I suppose, amalgamated with the Royal Marines. We know that this subject has been brought up in this theatre on various other occasions, notably by Sir John Colomb, and we know perfectly well that the Admiralty have always set their face against it. I presume the reason that the Admiralty has always done so is lest the efficiency of the men-of-war should suffer through not having the men constantly on board, because, of course, it would mean increasing the Marine Corps to probably about five times its present strength. Another thing is that the Admiralty have recently reorganised the system of entering officers into the Navy. The officers are now entered so that they may be practically interchangeable with all three branches. We have no experience of that as yet, but we know perfectly well that the system has already been commenced at Osborne in the Isle of Wight. The result is that the future naval officer will have quite enough to learn. He will have to learn his seamanship up to a limited extent, I suppose, but certainly to a certain extent; he will have to learn his naval gunnery and his torpedo work; and he will now have to learn marine engineering and military work, as the present marine officers do, in addition to which he is apparently to have piled on him the work of the defence of sea fortresses, so that it would result in the naval officer of the future being rather over-burdened with work, and he would become a sort of Jack-of-all-trades. Then, with regard to the Marines,

we know that the Admiralty consider them a very valuable body of men on board ship. Some people think that Marines are of no use on board ship. My experience is that on asking naval officers whether they would like twenty additional men attached to their vessel, and whether they would have them seamen or stokers or Marines, I have nearly always been told that they would rather have twenty additional Marines, which shows that the Marines on board ship are thought very highly of by the naval officers. The Marine, of course, would lose his value very considerably if he only spent one year in ten at sea, because I see the lecturer proposes to man all the sea fronts of all fortresses with Marines, or, as he says, men from the Navy. But he does not tell us who is to command these fortresses, whether they are to be naval officers or military officers. In one part of his paper he suggests that the sea fronts shall be defended by the Navy or Marines, and the land fronts by the Army; but that is also a divided responsibility. We therefore do not know who is to command the fortresses. It may be a naval officer. If so, he would also apparently have command of the land forces on the land side.

Admiral the Hon. Sir EDMUND R. FREMANTLE, G.C.B., C.M.G., Rear-Admiral of the United Kingdom):—I have not read the lecture, and consequently I do not feel entirely competent to criticise it in every way. I shall, therefore, confine my remarks chiefly to the question of principles, and also to some things which I think show the way in which we ought not to defend our ports. I take exception to the fourth principle laid down by the lecturer, that "if we relied on our sea-going fleets to secure permanently the safety of our naval bases and our chief commercial ports, it would be necessary to have, within striking distance of each such place, a fleet equal to the whole fleet of the enemy in being at each period of a war—a wholly impossible idea." I venture to think that is a false idea of strategy. I admit that we did not fortify Wei-Hai-Wei on that principle. We say that if we were to fortify Wei-Hai-Wei we should have to fortify it against the attack of a fleet, possibly a Russian fleet from Port Arthur, and, therefore, as we do not propose to put up extensive fortifications there, we do not put up any at all. I do not think that is the right principle of strategy. If there is a Russian fleet in Port Arthur we ought to be able to mask that fleet; we ought to keep it in hand, which the Japanese are doing at present. On the same principle I think this one laid down by the lecturer is wrong. If there is an enemy's fleet somewhere at Cherbourg, and we have got a sufficient fleet, we should be more or less watching that fleet. Even supposing our fleet was away for a little time, and the French fleet could manage to slip out, would it be a wise thing for that French fleet to come to Plymouth, to do a certain amount of damage, but in returning to be knocked about as well, possibly to lose the whole of their fleet? After all, if they lose the whole of their fleet it does not very much matter if we have lost the dockyard, as they certainly would lose their fleet, because our more powerful fleet would intercept it. But nobody does do that sort of thing. In the books that we read sometimes—we have not seen so many of them lately—called "The Coming War," and so on, you generally see that the fleets fight in a sort of Kilkenny cat fashion. I well recollect one that I read some years ago, in which the Russian fleet was supposed to go up the Tyne and do a certain amount of damage there, losing ship after ship, and, eventually, fortunately for us, the whole Russian fleet was destroyed. That is the sort of thing which is absolutely and entirely unreal; it is not the sort of thing which takes place in real warfare, and consequently it argues a great want of sense of proportion to propose that it will be done. I have only

one other remark to make, and that is on the subject of whether defences are proper to the circumstances of a particular port or country. I should like to refer particularly to some defences near Plymouth on the west side, where a system for high-angle fire, which was very much in vogue about ten years ago, was adopted. When I was in command at Plymouth, I recollect going round with the Commander-in-Chief (Lord Wolseley), Sir Redvers Buller, and others, to see all these defences—chiefly high-angle fire batteries, which were supposed to be very important, and to embrace the latest improvements. I was asked: "What do you think of them?" I said: "I have no opinion as to their firing, because I have only seen the guns fired once or twice, when they did not make as accurate shooting as I am told they did on other occasions; but if they made the most accurate shooting in the world they are absolutely useless. The best thing you can do is to blow them up." I do not know what has become of them now; but they were absolutely useless, because the assumption was that some Power—not a Power that I know anything about—had the entire command of the sea, but had no land forces. It would not think of landing an army in the Yealm or in the Thames, or anywhere else, because it had no army. That was the assumption. But it had any amount of mortar-boats and a large fleet; and the assumption was that it would lie somewhere in Whitsand Bay and would shell over the heights into the dockyard, with the chance, after throwing a very large number of shells, as we did at Sveabourg, that they would do a certain amount of damage to the dockyard. That is an assumption which, strategically, is entirely wrong. And that is not the only instance I know of, because a Zalinsky gun was put up near Pembroke to prevent an enemy's fleet lying outside and throwing shells from Bristol Channel over the heights into Pembroke Dockyard. I will only quote those instances of the way not to do it. What we do want, I venture to think, is a certain amount of direct defence, mine-fields, quick-firing guns to protect them, and a certain proportion of heavy guns to prevent the enemy coming directly into the port. Those guns would be proportionate to the position of this country, which is supposed to be, and, I hope, still is, the greatest sea Power in the world: and she would naturally be supposed to have command of the seas; and if she had not command of the seas we know perfectly well that no amount of defences will enable her to retain her place among the nations.

Colonel F. A. Bowles, R.A.:—There are one or two questions I should like to ask the lecturer, which, perhaps, he will answer afterwards. In his lecture, Colonel Cotter states that "I am divulging no secret when I say that no nation dreams of using mines which explode on mere contact." I am only asking for information, but I have an idea that when the electro-contact mine, as it is called, is put in working order, it does go off on contact. The lecturer rather conveyed the idea that the firing of a contact mine was just as deliberate an action as the firing of a gun; but I think I am right in saying that as soon as the mines are put in a dangerous condition the ship does the rest. I think we may safely say that some nations dream of using them, and we know that one nation lately—if the accounts in the newspapers are correct—has certainly suffered from using contact mines. With reference to the boom at the western entrance, I understood the lecturer to say he proposed to put two booms across what he called "The Narrows," *i.e.*, 1,200 yards, leaving a friendly passage of 300 yards between them. I am not an expert in reference to booms, but I hardly think a boom 450 yards long would be manageable; and unless stone piers were built out to a very considerable distance, I think no boom

could possibly be fixed in the western entrance. Even the eastern entrance, I think, is a little too wide to erect a boom. I believe it is an understood thing now that booms will not be very often used, probably for the reason that there are very few places which are suitable for them. I think at both the western and the eastern entrances booms would be rather unwieldy things to work. Supposing a boom at the eastern entrance *was* placed in the position which the lecturer suggested, I think we must raise the question as to the position of the electric light, because the whole of the boom would be in the full light of its beam, and I think it is not an accepted principle that the boom itself, if you have an illuminated area in front of it, should invariably be in darkness. I think it would be useful if the lecturer would say something in reply in regard to that point. I should like to be allowed to say a few words in regard to some of the remarks that have been made since the lecture. With reference to the heavy and medium gun defence, I think all our coast defences now are founded on the principle that England must have command of the sea. The lecturer in his lecture asks, why have heavy and medium guns. I think the simplest answer is: In order that we may never have to use them. What I mean by that is that I think our heavy and medium gun defence is more a preventative than a form of defence that is ever likely to be of any great practical value, because as long as we have command of the sea no serious attack on any of our well-fortified ports could ever be successfully attempted by any country. With reference to anti-torpedo-boat defence, I endorse what little has been said by the lecturer. I cannot help thinking that every possible occasion should be taken advantage of to impress on anybody who has to deal with our defences the vast importance of a thoroughly organised and good anti-torpedo-boat defence. We have had no practical experience until very lately of the rapidity with which these attacks will be made. We have always said in our text-books that torpedo attacks will be made probably before war is declared, and that has certainly been justified by recent events. What we want is a very strong anti-torpedo-boat defence. The lecturer has also said a good deal about another subject which is still in a rather embryo state, *i.e.*, the very great difficulty of distinguishing friend from foe. The lecturer pointed out what he considered would be a good system.

Colonel E. W. Cotter :—I beg your pardon; it was a general outline.

Colonel F. A. Bowles :—Probably a great many of the audience know that what the lecturer considers an outline of a good system is practically a fair description of what actually was tried at the recent naval manœuvres. It had many faults; but no system, in my opinion, that has been tried yet, can be looked upon as a perfectly successful system. It is almost impossible—I should say it is quite impossible—for anybody, even a naval expert, to be able to tell at night the difference between his own torpedo-boats and the enemy's torpedo-boats when an attack takes place, no matter what the rule may be. Supposing the rule is that friendly torpedo-boats, if they are moving about, are to advertise their presence in every possible way by showing all their lights and sounding their sirens, I have always maintained that it would be very easy for the enemy (who would know more about our arrangements than a great many of us know ourselves) to do the same, and, as far as we can judge from what we have read in the newspapers, that is what the Japanese did do; they showed all their lights; they came in as though they were friendly torpedo-boats, and by that ruse they got quite near to the Russian ships before the Russian ships knew it—if they ever did know it—until the torpedoes had actually taken effect. It

is difficult to know how much to believe of what one reads in the papers; but if we do believe what we have lately read, we know that the Russians have not only sunk their own torpedo-boat because they were thought to be Japanese boats, but they have also allowed their own ironclads to be torpedoed by the Japanese because the Japanese torpedo-boats were thought to be Russian boats. If both those accounts are true, it only enforces still more the absolute necessity of our having some system of knowing without any doubt at all whether a torpedo-boat moving about at night is an enemy's boat or not; and that really is the crux of the whole thing. I think with our present system of defence of guns and lights, provided they are properly arranged to begin with, which is most important, that we are in a more advanced state than some of those who have spoken since the lecture are aware of. I think we should make a very good attempt at keeping torpedo-boats out, if we knew for certain that they were the enemy's torpedo-boats. It seems to me that the only possible rule which will meet with any success is that no friendly small boats are to move about at all during the hours of darkness, otherwise it gives the gunner absolutely no chance at all. A young subaltern of the Garrison Artillery, in command of two guns, cannot take the responsibility upon himself of firing on boats unless he is perfectly certain that they are the enemy's boats, while if he hesitates half a moment he is lost; he will never have the chance again. Torpedo-boats, once they are seen in the illuminated area, do not give you a very long time to fire at them, and if you are not ready to begin on the instant the boat is visible over the sights or through the telescopes of your guns, you get no chance. Therefore I say it is absolutely necessary to lay down the rule that no friendly torpedo-boats are to move about at night within any waters that are defended by guns. I should like to be allowed to make one or two remarks about high-angle firing, because some remarks have been made which rather tended to show that it would be just as well to blow up high-angle batteries altogether. I am rather an advocate for high-angle firing. I know that experiments were tried at Plymouth some years ago, and I believe it was because of those experiments that high-angle guns were condemned by a very large portion of the military world; but I am not of that opinion myself. I am certain that high-angle firing guns can be worked up to very fair accuracy, quite sufficient accuracy, I think, to make them extremely useful in certain waters. Of course, they are not applicable to many places, but there are certain places where I think they would be most useful; anyhow, they would have the effect of keeping the enemy's ships on the move. I am open to correction by naval officers, but I have heard it said that a naval officer funks high-angle fire more than anything. If it does hit, it hits him in a place where he has not much protection—the unarmoured decks, and I have always heard that it is a form of defence that the Navy will not run the risk of encountering. I just mentioned that because I am rather keen about high-angle firing, and I think it is a pity that it should be condemned without more experiments being carried out.

Admiral the Hon. Sir E. R. Fremantle:—I should like to say that I believe it is a fact that the Admiralty's arrangements are, on the whole, quite complete (whether they are sufficient is another question) with regard to the closing of the ports, and also with regard to distinguishing our own vessels from those of foreign Powers. Those arrangements were practically completed before I left Plymouth five years ago.

Colonel E. W. Cotter, in reply, said:—It is a very different thing to read a paper and have to speak extempore; but somehow I gather from the

tenor of what has been said that although there has been a good deal of criticism, there is no disagreement with my general conclusions, except in regard to the one about handing the defences over to the Navy. That subject I left to itself, apart entirely from the rest of my lecture. I only raised that point because the result of my study has brought before me the fact that at every stage, no matter where, I was always confronted with the query: "What would the Navy want in the matter?" I was asked a direct question by one speaker: "Were the Navy ever asked?" All I know is this, that I always asked the Navy whenever I came across any naval officer.[1] I know that the same idea that was condemned by one of the speakers about a ship lying outside the fire of the batteries and bombarding the dockyard from the open sea, caused a long discussion at one place where I was, and it was raised in the first instance by a naval officer. It was not the foolish military officer that raised the question on that occasion, and, as General MacCalmont knows, I did not believe it was a practical point. I say this because remarks were made suggesting that we do not do these things reasonably. I appeal to you whether I have not tried throughout my lecture to give a reason for every step I took. Throughout the whole of the paper I have put my own branch of the profession last, because I felt that naval considerations in regard to coast fortresses must be entirely paramount. Admiral Close said we are not ready. Why! I said that I see no defence unless we are ready. We must be ready. If there be, as I said in some part of my lecture, a chance of torpedo-boats doing destruction in a harbour before the declaration of war, the only thing for us to do is to get ready when war is imminent, and be ready when negotiations are broken off. I think it was Colonel Johnson who said he would prefer to have batteries on a low site. I disagree with him altogether. I have not the least doubt in my own mind about it; but he is entitled to his own opinions. It would be a reversion to the old argument. I would infinitely rather have one gun in the open with 120° arc of fire than three or four guns with 30° arc of fire, boxed up in a casemate where they are not so ready to fire.

Colonel R. F. Johnson:—I was not talking about casemates. I said in certain cases batteries which have an all-round fire would be better at low site than a larger battery, because you get shorter range, and therefore much greater penetration.

Colonel E. W. Cotter:—Of course, if to get height you have to go a long way off, then the advantage of your height would disappear. If my drawing were put on a scale you would find that the slope of the hills[2] is 10°, so that the guns never lose more than about 100 or 200 yards range. Somebody said that the Navy should be confined to offensive operations. There is something to be said for that. Personally I think they should be confined thus:—Everything in which naval considerations are paramount should be done by the Navy. If it is offensive it should

[1] I expressed myself very badly here. After lecturing for an hour on a theme, the text of which was that naval considerations should be paramount, I was naturally startled at being asked by Admiral Fremantle if I ever consulted a naval officer. Answers crowded into my mind, but I could not at the moment put them into words. Suffice it to give but one. A naval officer was consulted about every battery built under me during my tenure of command as C.R.E. He was consulted before they were commenced, and he visited them during progress.—E.C.

[2] *i.e.*, the hills on which the heavy batteries were placed.—E.C.

be done; if it is defensive it should be done; but that of course is a naval question. The question was raised about the anchoring of a boom. I do not see why a boom should not be anchored across the water where I showed. Of course, no boom would be 1,200 yards long; there would be two booms in the main channel, one at either side of the friendly passage. With regard to the torpedo-boats at night, I always understood that every torpedo-boat which attempted to enter a defended port at night would be fired at. There is one thing I should like to add before concluding. I have said that we are apt to overdo our defence by heavy guns, and apt to underdo our defence against torpedo-boat attack. In connection with that I may have been misunderstood. The officers who have been recently responsible for our coast defence have shown great insight and wonderful courage in the way in which they have placed but one gun where two or three guns were placed before; and with regard to what they have done against torpedo-boat attack, I can see no improvement possible. As to the style of the defence adopted, the only question is that I think we have not thoroughly realised how very necessary it is to go a great deal further on the same lines. I am very much obliged to you, Sir, for taking the Chair, and to you, gentlemen, who have discussed the paper.[1]

The CHAIRMAN (Major-General Sir Hugh MacCalmont, K.C.B.):—We have listened to a very instructive lecture and a very interesting discussion, though I do not mean to say that the discussion was not instructive too; as far as I am concerned, it was very instructive. It occurred to me that the main point of the lecture is point No. 5:—"It is possible to secure harbours by defences placed on or based on the land without inordinate expense." I remember the case of Belfast Loch, where I lived some years ago. The place was absolutely undefended. It comprised a narrow channel leading up to a great manufacturing town and great ship-yards, which were practically at the mercy of any cruiser which thought it worth its while to work round and do some damage. The Navy cannot command every port; it cannot be everywhere, and it would be quite worth the while of any cruiser to make a raid on a place like Belfast. I wrote many letters in the papers at the time I lived there to call attention to the great risks involved. Within the last three or four years the place has been adequately defended, and, as Colonel Cotter has pointed out, at quite a comparatively trifling expense to that of making the Navy responsible for everything of the kind. It appears to me to be a matter entirely of economy. There is one question I should like to ask the lecturer. Colonel Cotter said that these contact mines were entirely out of date. We were given to understand that no nation would use contact

[1] *Addendum.*—I gather from the discussion that I did not make myself clear in the last paragraph of my lecture. I wish I had said: "Placed under the Admiralty" instead of "handed over to the Royal Navy." I never intended that sea-going naval officers should come ashore and command land batteries, nor did that follow from the text. Again, when I said that the present Fortress Artillery and Fortress Engineers would be included with the Corps of the Royal Marines, I did not mean complete amalgamation, for of course the two existing Corps of Marines are not amalgamated. I meant that the Coast Defence Corps should bear the same relation to the Admiralty as do the two existing Marine Corps; but it does not necessarily follow that the new body would be sea-going, and therefore it does not necessarily follow that the R.M.A. and R.M.L.I. would get one whit less sea experience than they do at present.—E.C.

mines. But we read in the papers the other day that the Russians blew up one of their own ships through it touching a contact mine.

Colonel E. W. Cotter :—If I may answer at once, I would say we do not know enough of what has occurred; we cannot rely exactly on what we read in the papers. But I think Admiral Fremantle said the other day in the papers that no nation would dream of using purely contact mines. You must, in addition to the contact, have another act, a very deliberate act. Of course, when that deliberate act is taken, then if you knock against the mines you blow yourself up. Whether the Russian arrangements were very bad or not, as I am not a naval officer, I do not say; but I cannot understand them. They may have in this respect done one thing by mistake, viz.: performed the deliberate act, so that when the contact occurred the ship was blown up. However, we cannot tell that until we know more about the details. But I do not believe they have used purely contact mines.

The Chairman :—Then I should like to say that one of the speakers inferred that the advice of naval officers was not taken in regard to these land defences. I know of one case in point in which nearly all the work was done on the initiative of an admiral, though I cannot, of course, mention either the man or the place. At any rate, I know in one most important case that it was entirely on the admiral's initiative certain steps were taken; and I remember his making the remark to me: "If you put guns of such and such calibre in a certain place no battle-ship will ever come near it." And the admiral's view was acted upon. I do not think there is anything else I need say, except that I am not altogether prepared to agree with Colonel Cotter's proposal to hand over the coast defence to the Navy. I am one of those people who think that everyone ought to be allowed to do his own business, and that all the land business ought to be done by the land forces. If it is a question of signalling, then the land forces, the Garrison Artillery, and so on, should be thoroughly educated for the interchange of all signalling with the Navy. There is a tendency for everybody to try to do everybody else's work. For instance, in the cavalry there are three men to one horse. Before you provide the three horses for the three men you proceed to mount the infantry. That is our way of doing business; it is a sort of Jack-of-all-trades plan, which I am quite certain is not conducive to efficiency. I desire, on your behalf to propose a hearty vote of thanks to Colonel Cotter for his very able and instructive lecture.

MANCHÛRIA AND PORT ARTHUR.

By Colonel C. E. de la POER BERESFORD, p.s.c., late Military Attaché, H.M. Embassy, St. Petersburg.

MANCHÛRIA is the home of the Manchû dynasty. At the commencement of the 17th century, the fifth king of Manchûria, tired of the injustice of the effete Mings, swore vengeance against them, and vowed a propitiation of 200,000 heads to the shades of his ancestors. Elated by the easy conquest of Liâou-tung, he entered China proper, but was beaten back. His first success had so inflamed his pride that he usurped the title of Emperor, and named his reign Tuen-Ming, or "celestial fortune," invoking divine protection on his race. He died in 1627. His successor, educated amongst the Chinese in order to learn how to govern them, reigned under the name of Tai-tsûng, which was changed in 1636 to Tsing-te. The new dynasty received the appellation of Tsing, or "the pure." But it was not unaided or without a struggle that it came to power in China. The whole of Tâtary had been alienated by the corrupt Ming race. Its western, northern, and eastern hordes formed up as of right, centre, and left in battle array against China. The Mongols thus became the right wing of the Manchû invasion. Allied in blood and customs, the two races were *pares* without a *primus*. The Chinese people rose up in rebellion against its masters, under two leaders. One of them, Li-tsé-sheng, proclaiming himself Emperor in Shen-si, marched on and occupied Pekin. Hwai-tsung, the Emperor whose reign was called Tsung-tsheng, hanged himself with all his family. The Manchûs, seizing their opportunity, and called in by the traitor, Hou-sân-Kwey, the general ordered to oppose them, rushed into China. They entered Pekin in 1644, and under the pretext of avenging the dead Emperor, got rid of his victors. The Manchû chief died soon after his conquest. His boy son, Shun-tshî, was proclaimed Emperor. In a few months, his horsemen had subjugated Korea and North China; the southern provinces submitted only later to his rule. The triumph of the Manchûs is generally dated at 1644, but officially the new dynasty began in the Tuen-ming reign. Victory was only completed in 1647, or even 1652.

These new conquerors of China were real barbarians, lately arrived from the head waters of the Selengà and Yeneséi, at the borders of the Empire. They lived on the spoils of the chase, and ate bread, not rice like the Chinese. Their idiom was different to most peoples' of Tâtar origin. They had, like the Mongols, lately received an alphabet from across Asia derived from those of Arabia and Irâk. They, like the Mongols, wrote vertically, not horizontally. These hardy horsemen despised the effeminate Chinese, their fans, and their litters. But the victors succumbed to the vices of the vanquished as the Turks fell to the seductions of the Byzantine Greeks. The women of the Manchûs were free. Instead of cramping their feet as did the Chinese, they taught their wives to ride on horseback with them. Fair or red in complexion, they wore their hair in a queue, to tie up their bow, so as to keep its string dry when crossing rivers. Heavy were their clothes,

their hats pointed and grotesque in form. The Chinese, who wore their hair waved round the crown, were forced to adopt the Tâtar tail. The little Manchû nation had not been able to conquer China without vacating its own territory. The place they left was occupied by an inrush of Chinese from Shan-tûng, Chi-li, and Shân-si. The Great Emperor Kâng-shi succeeded Shûn-Tshi, who was killed by a chief whose wife he had loved too well, in 1661. Kâng-shi encouraged the emigration of the Northern Chinese to Manchûria. So it comes to pass, then, that the Manchûs of to-day descend in the main from Chinese, as their black hair and yellow skins testify; whilst the Hûn-houzes, or Red-beards, with their fair but bronzed faces, are the true descendants of the original owners of the soil. The Emperor Kâng-shi's glorious reign is known to the veriest dabbler in Chinese history, which I have only dealt with in so much as it influences the story of Manchûria. My version is correct, for it is taken from the "Mémoires sur la Chine," by the late Marquis d'Escayrac de Lauture, a well-known authority on China and things Chinese. He was taken prisoner to Pekin, together with Sir Harry Parkes and Lord Loch in 1860. Poor d'Escayrac! Less fortunate than Loch and Parkes, his brilliant career was closed at the early age of 41 by the effects of the cruel torture inflicted on him by his Chinese captors.

Manchûria is divided into three provinces: Hen-lûng-tsian, Girin, and Schön-tsing, or on some maps Shön-King. Of these provinces, Hen-lûng-tsian is the northern. Its inhabitants, like the Belgæ, are the bravest, but the country the most inhospitable. Hen-lûng-tsian is partitioned by the Hin-gan Mountains into two basins, that of the Amûr and its great tributary the Nonni, which is joined by the Sungari, close to Boduné in the Girin province. It is a land of wind-swept uplands, of babbling streams, of great forests. Like Caledonia, it is stern and wild. It produces gold, timber, hides, and cattle. The Mongols come over the southern border in considerable numbers, offering to barter their mares' milk whiskey for the Russian vodka, which they find stronger and more to their taste than their own production. They suffer much from rheumatism and lumbago, caused by their cold winds and the fact that they often get drunk when wet, and retire to rest without changing their clothes. All the province of Girin south of the capital and to the east of the Mû-dân river is mountainous, wooded, and almost impassable. Its lakes teem with fish. In the hills are bear, boar, deer, the argus-eyed pheasant, cock, snipe, etc. The lowlands produce maize, millet, beans, rice, tobacco, hemp, and apples, whilst gold and coal are found in the mountains. Hûn-Chûn, the centre of the coal district, is on the east frontier, near Vladivostok. This province takes its name from its capital, situated on the upper Sungari River, which acts as main artery to this rich and prosperous land. The country between the Mûdân and Sungari streams is flat and fertile, and of all Manchûria, most favourable for cavalry action. In winter it is frozen hard as a rock, and is passable everywhere for all arms; but in summer it is much cut up by arable land crops and various enclosures, whilst the roads are but poor communications, scarcely more solid than the fields at their sides. The southern province of Manchûria is the smallest of the three, but the best. Its name is Shön-King, its capital, Mûk-dèn. Blest by a good climate, with a short, very cold winter, a rainy spring, a sun-flooded summer and autumn, it produces everything that the heart of man can desire. Its wooded hills are stocked with game, and in their recesses are found

gold, silver, iron, and coal. Its fine rivers, Liaou, Hûn, Dalin, and Ya-lû, are full of fish, and carry much traffic. Its fields are covered with maize, melons, corn, and luscious grasses. Its homesteads, with their thick walls and barns, resemble those of Hampshire. Its cities, their high pagodas embowered in trees and surrounded by castellated walls, woo you like Cologne or Canterbury in the distance from the level plain.

Russia, it must be remembered, is fighting some 5,000 miles away from home. She has driven a great railway through the heart of her Asiatic possessions, on which, since the command of the sea has been wrested from her by Japan, she has to depend entirely for the despatch of men, stores, ammunition, and some food to the Far East. As far as Lake Baikal the trains are lit by the electric light. The ordinary trains depend on candles as an illuminating power. The locomotives burn wood from Moscow to Krasnoyarsk, and coal onwards to Lake Baikal; wood in Trans-Baikalia and Manchûria. On the western side of the lake they are of French manufacture from Créil or St. Chamand. On the eastern side American engines are chiefly used. The way is gradually being re-laid with 24-lb. rails, manufactured at Ust-Kataf, Prince Bélosselsky-Bélosersky's iron works in the Ural Mountains, at which works new cisterns of an improved pattern for every station along the line are now being turned out. When the heavier rails have been laid, and the sleepers properly ballasted, which takes time, the excessive rolling and jolting of the vehicles, so disagreeable a feature in this Trans-Asian travel, will be considerably diminished. This motion is the more noticeable, as in European Russia the cars run very smoothly and evenly. The rails do not, as with us, lie on chairs, but are simply nailed down to the sleepers by 10-inch nails, and secured at the junction by fish-plates, pierced with six holes for screws. Such an arrangement may do well for light and slow traffic, but evidently rapid and heavy trains would in their passage tear such rails from the sleepers, and indeed, perhaps, the latter out of the ground. So in Russia proper no trains are long. The Siberian express consists of four passenger corridor cars, a luggage, a post van, the locomotive, and tender. Each car is 11 metres long, so the total length of the train is about 70 yards. On the Trans-Baikal section trains are much longer, but the pace is not more than 15 miles an hour. The curves on this section are unnecessarily sharp. But that the carriages run on bogie wheels I do not think these curves could be managed. I believe that this matter is being remedied. Ballast, ballast, ballast, is what is urgently needed all along the line.

In spite of all these disadvantages, the Siberian Railway is a most useful strategical factor in the campaign now taking place in East Asia. Since October, 1903, at least 240,000 men have been moved into Manchûria. They have not all come from European Russia; if so, the rate for the four months ending 31st January, 1904, would run to about 14,000 a week, or four troop trains of 500 men per twenty-four hours. In spite of the enormous exertions which have been made, such a result could not have been achieved, as it would be impossible to get the empty carriages back along all the length of the line, even if sufficient rolling stock were available. But if I say that, on an average, 10,000 men a week have been moved along the line since October, 1903, my readers will not, with reason, be able to accuse me of exaggeration. After all, if the matter be considered, that in 1900,

when the railroad was in its infancy, it transported 52,000 in fourteen weeks, it is not surprising to hear that in 1903—1904, after long matured preparations, four times as many have been moved in five months. Now that Baikal is frozen over, reinforcements for Manchûria can arrive but slowly. Russia, in my humble opinion, committed a mistake in arousing Japan's irritation before her communications were complete. Until the Circum-Baikal railway is finished, her grasp on the Far East in winter time, that is for five months in the year, will necessarily be comparatively feeble. The ice is, here as everywhere, at once her worst enemy and her best friend.

The garrison of Port Arthur numbers about 20,000 men. These are principally quartered in the forts and batteries. As one approaches the fortress, and is still 16 miles distant, Fort Sampson, a sea defence, looms 2,000 feet above on the left. At Sokato is the junction for Dalny; here a line of temporary defences against the land side has been thrown up. The Liaou-tung Gulf is now visible for the next 10 miles. Then the hills close in, and passing between Table Hill and Lu-chûng-Kau, each crowned by powerful forts, the train steams along a muddy estuary's bank, past some mean buildings, and draws up at Port Arthur.

The strategical importance of Port Arthur is that it commands, so far as a land fortress can, the Gulfs of Chi-li, Liâo-dun, and Korea. It is favourably placed, therefore, to serve as base of operations against either Tientsin by Takû, Chi-fû, Wei-hai, or the Ya-lû river ports. On the other hand, its land communications, placed as it is on a peninsula, are defective. From the Bay of Tsin-Chou, in the Liâo-dun Gulf, or Lio-chû-tûn inlet in the Korean Gulf, a battle-ship or cruiser standing out at three miles from the shore could cause great trouble and loss. Landing parties, although preparations have been made for their reception, could also make things unpleasant. Tactically speaking, Port Arthur is very strong and difficult to take. The fortifications which surmount every hill on the land side are semi-closed works; but their gorges are protected by masonry, loop-holed walls, almost as solid and inaccessible as those of Tregantle, Scraesdon, or Portsdown Hill. These forts, constructed under the eyes of General Vernander, of the Engineers, a worthy successor to Todlèben, are on the kaponier trace; their kaponiers, deeply sunk in the ditch, are also protected by counterscarp and escarp galleries. Their guns, which consist of 5·9-inch, taken from the Chinese, and 7, 10, and 12-inch breech-loaders (Oboukoff pattern), are mounted either en barbette on disappearing carriages (something like our Moncrieff type), or on overbank fire carriages of the Poutiloff pattern. The total number of guns in the fortress is given by the Russians as 400. I counted ten hill forts, four sea batteries of eighteen to six guns each, and estimated the number of guns on the *Zolotaia-Gora*, or Golden Hill, which I was not allowed to visit, as fifty or sixty, divided among six to eight batteries.

On arriving at Port Arthur by sea, the four long batteries to the south of the harbour entrance strike the practised eye. No guns are seen, but from the interior of the harbour above the Tiger-Tail torpedo-boat sheds they can and have been counted, noted, and their description forwarded to Tokio. From the sea it is impossible to count or even locate the batteries on Golden Hill. Their profiles are so low and carefully covered with grass or material of the same colour as the surrounding ground that they are invisible; but the guns do not fire through embrasures. How they are mounted it is hard to say,

as no one dares to use a field-glass at Port Arthur. But their carriages look from a distance like 10 or 12-inch Poutiloff pattern, which are well known to artillerists all over the world. Not only are all the sea batteries more or less invisible, but—and in this they resemble the works at Kertch, and also one of the new batteries at Batoum—they are all placed high above the level of the sea. Thus they command a greater range, can bring plunging fire to bear on a ship's deck, and are themselves almost safe from direct, as opposed to high angle fire. By the latter alone can they, as a rule, be struck. The protection to the gunners and guns in these works is very effective. There is no difficulty from smoke, as in works with closed galleries, nor can the men serving the pieces be struck by splinters of stone, for the works are of earth. The communications between the batteries, which can be seen from the land side, are safe from search by enfilade by their trace; the prolongation of which falls either on the site of other works or inaccessible land positions. They are hidden from direct view and fire by the crest of Golden Hill, on the north side of the harbour entrance, and on the south side they are almost invisible from the sea. The communications between all parts of the outlying defences and the dockyard, the artillery park, the old town, and the new town are excellent macadamised roads, safe from fire.

It is now necessary to speak of the stores, of the abattoirs, wells, ammunition, food, forage, water supply, sanitary arrangements, spare carriages, guns (field and siege), barracks accommodation, stabling for horses, hospitals (permanent and field), cooking, etc. Space fails me to go into all these at length. The exact number of projectiles per gun is not known, but as for two and a half years' ammunition has been sent both by land and sea to Port Arthur, it is probably as large as that of Sevastòpol, Kertch, or Batoum. Groats, tinned provisions, wines, and spirits have been brought in enormous quantities from Russia, England, Japan, and, above all, America and France, to Port Arthur. Bread, meat, and vegetables are dearer, and scarce in comparison. Vegetables come from Manchûria. Meat used to come daily in Messrs. Butterfield and Swire's boats from Chi-fû, in Shantûng, ninety-eight miles off. For the last year or more a Russian tri-weekly service has brought over some eighty beasts in very good condition, besides vegetables, salads, and fruit, from Chifû. The supply is not so regular or large as when carried by the English boats, but it has been considerable. The wells are numerous. The soil is limestone; rainfall heavy in spring only; climate in summer and winter almost rainless. The old Chinese wells are foul and dangerous. The new Russian wells are better, and in garrison towns the Russians boil all the water issued to the troops. Cholera was severe at Port Arthur in 1902, carrying off as many as 150 per diem, principally natives. The abattoirs situate near the artillery park, north-east of the harbour, are large and well arranged. Immense stores of forage have been accumulated, but the daily consumption is very large. Numbers of horses, mules, and donkeys have been brought to the place. There was a large civilian element, both Russian and Chinese, composed of tradesmen, coolies, and land sharks of both sexes. These useless mouths have all, or nearly all, disappeared.

There can be no doubt that whoever attempts to take Port Arthur will have an excessively difficult task. The garrison probably now stands at about 20,000 men, with, say, 10,000 sailors. And it would be well for our readers to take the testimony of an eye-witness, and believe, that contrary to some of the reports of our press, the quality

of these troops is quite first-class. Lately a good many men have been directed from the fortress on the Yâ-lu river, and Liaou-Yang.

Port Arthur Harbour is a land-locked inlet of a tidal sea, with a great flux. Thus at low tide, the room is comparatively small. Admiral Alexéieff tried by dredging to remedy this unsatisfactory state of things. The total area of the harbour at high tide, may be about equal one quarter that of Portsmouth. Its entrance is very narrow, and not more than a quarter of a mile broad at most. On the east side is the steep declivity of Zolotaia-Gora, or Golden Hill, with signal station and some eight batteries of heavy guns. On the west side a lower limestone rocky ridge, some 150 feet high, hides the whole harbour from the sea. On this are four great batteries, with from eight to eighteen guns of 7, 10 and 11-inch calibre, as described. As one steams in almost north-west by north, a low hill with an estuary to the south-west of it, appears facing the entrance. It is covered with rather mean houses, which will in time give way to official residences. Before proceeding far, and slowing down, one observes on the north-east a low masonry wall at the edge of the water. The sea laps its sides at high tide, leaving a yard or two of mud at low tide. On this are mounted some twenty quick-firing guns with shields. The battery is, perhaps, 150 yards long; the guns are very close to each other. They would be very deadly against boat attack, as they are trained, so to speak, on one spot, and can be fired night or day without change of aim. Opposite this on the port side to the south-west is another quick-firing battery. This battery mounts a dozen guns at least. It is immediately below the hill on Tiger-Tail peninsula. On this spit of land has been built the torpedo-boat shed, now in full working order. Here, if boats are not actually built, they are hauled up on slips, and all possible repairs can be made. The shed has all the necessary engines, lathes, shops, etc. It is needless to say that this and the whole fortress, except the outlying forts, are lit with the electric light. At least two 10,000 candle-power projectors send their beams seaward at night to sweep the approaches with a flood of light. To the north-east lies the coal depôt, perhaps 350 yards from the entrance from the harbour. It is close to the shore, and occupies all the space between the outer end of the twenty-gun quick-firing battery under Golden Hill and the entrance to the basin. A wall cuts it off from the dockyard on the land side; on the side of the sea, ships can come almost alongside. It is in a bad position, as the ground makes a salient, and the heaps of coal are nearly, but not quite, exposed to view of a steamer passing the entrance of the harbour. The Cardiff coal, which is stacked in uncovered heaps, amounts, it is said, to 15,000 tons. A probable danger to the coal is that an enemy knowing its bearings might destroy or knock it about into the basin and harbour by long-range fire. All the projectiles so aimed which missed the coal yard would fall into the basin, the dockyard, the Saràtoff Restaurant, the Russo-Chinese Bank, and the shipping. Port Arthur, in a word, is a cramped harbour, with a bad entrance, a small dockyard, and only one dry dock.

I left Port Arthur on July 10th. On that day, the first case of cholera appeared at that place. The peninsula of Liâo-tûng on which are situated the fortress and the town of Dalny (*i.e.*, "far off"), is treeless and waterless, save in the time of the spring floods. All the provisions for Port Arthur's sustenance and of the coolies along the line come from Chifû and Manchûria.

At Tâ-Shu, the service of trains to Pekin was now running regularly. What a difference between the state of the country now and that of two short months ago. Then only the early rye grasses, and a hedge here and there gave promise. Now all the crops were in the fulness of growth. The whole of Shöng-King is fertile in the extreme. Maize, poppies, corn, hemp, vegetables, melons, potatoes, yield luxurious crops. The great water-ways of Manchûria, fertilise it and enable its produce to be borne cheaply. The railway line is held by the Russian *ogranniye straji* (*i.e.*, frontier guards) in great strength. The stations built of the fine local stone, are now finished. Two days before our arrival at Tié-lin, the post there had been attacked by the Hûn-houzes. I was a little sceptical as to the frequent appearance of these people, but on this occasion there is no doubt they did attack and caused 3 casualties to the Russians. Tié-lin is on the railway, at the great bend of the Liâou River, which, rising in far off Mongolian hills falls into Liâou bay at In-kâou, or as we term it, New-Chwang. We had a long halt at Tié-lin. I came across one Pâvel Alexéivitch Tumânoff, a lieutenant in the East Siberian Rifles, who gave me a good description of the attack:—

"These poor devils of Hûn-houzes," said he, "whom we call brigands, are simply the former owners of the soil, who, having become dispossessed of everything they had during the campaign of 1900, now rove the country, living on the inhabitants. Whenever they can see a chance they attack the railway line. At first, they did a lot of harm, but now we have 50,000 straji, they don't bother us much. You see the line of hills there to the east, towards Korea, just beyond the coal mines you passed at Fâi-Hé? Well, we heard at Harbin that these people were gathering there, so General Alexéieff (the admiral's cousin, you know), who commands our brigade of rifles, the 5th, sent my company down post haste. We arrived on the evening of the 7th. On the morning of the 8th, just as we were preparing tea, we saw a cloud of dust, and the gleam of lances out there towards the hills. I formed a half company up in line lying down at 6 paces interval, with a section in the station in reserve. My left flank was resting on the Chai-hé stream there, and on my right was a section in the huts by the trees, a little to the rear. On came the Hûn-houzes on their little ponies, waving red pointed banners, their lances glittering, shouting loudly. It really was a pity to shoot them, they came on so gallantly, and rode so well! When about 600 yards off, I let them have a volley, and then ordered independent firing. You know what that means with a smokeless powder. In twenty minutes the Hûn-houzes were in full flight, about fifty of them were killed, many were drowned trying to swim the Chai-hé, and the plain was covered with riderless ponies. A few managed to get in on the left flank, and speared three of my poor fellows. One is dead, and another will never see *Mâtushka Volga* again; I think the third will recover. It isn't the attacks we mind, they are rather fun. But one never knows when we mayn't be ordered off by train to some infernal hole, and we can't call our lives our own, so constantly are we kept on the trot by Alexéieff."

I need not describe the run up in the excellent carriage which General Kondratovitch had placed at our disposal at Port Arthur. Our train crossed the River Sûngarî by the magnificent new iron bridge at 9 a.m., and steamed into Harbin (Sûngarî station); at 2 p.m. on July 12th. This time the journey took 48 hours.

At Harbin, there were on that day, 320 cases of cholera, and 110 deaths. All work was at a standstill, for the 20,000 coolies engaged in building had fled in a panic. We met parties of them on our way northwards, camping out on the steppes. Some had fled as far as Tsitsikàr, where we arrived at 9 a.m. on July 13. The railway line before this passes over a part of Mongolia. The temperature, which had registered as high as 100° F. in the shade at Chifù, now became sensibly cooler. Waving grasses, studded with masses of beautiful peonies, took place of flourishing crops. Cattle and sheep, driven by Manchûs, different in face and speech from the chattering Shan-tûng coolies, dotted the vast and verdant plains. On the 14th, the train crossed the Hingân mountain chain. On the 15th we passed Hailar, and arrived at Manjûrie, the frontier station and terminus of the East Chinese Railway, some 1,550 E. Miles from Port Arthur, at 5 p.m. Time occupied in transit, 105 hours.

Four and a half days in a train with the thermometer at 85° in the shade, and nothing to eat but sardines and Armour's tinned bacon, with indifferent local bread to supplement them, made us glad of an enforced rest here. The food at the buffet was less good than that supplied in barracks to the British soldier, but we were thankful to eat and pay highly for it. Manjûrie is a rising, literally a rising, town of some 1,500 inhabitants. It boasts a baker, a dry goods store, and an hotel, villainously dirty and very dear. Round the town are encampments of Buriâts with their ponies. There were some 300 coolies at work, but no cholera had appeared among them. Our baggage was here subjected to a not too rigorous inspection. We left Manjûrie on the 16th of July, taking first-class tickets (as by good luck a first-class carriage was attached to the train) direct to Irkûtsk. On the 17th, at 3 p.m., we arived at Karìmskaia, on the river Shilka, where we had to await the arrival of the train from Striétensk for six hours. The mosquitoes were bloodthirsty and numerous. This place is situated in a fertile valley, abounding in grass and cereals, watered by a noble river, on whose surface floated great rafts of timber on their way down to the Amûr. At Karìmskaia we got some hot food in the shape of the excellent *stschi* or vegetable soup, which all Russians, and only Russians, know how to prepare.

On, on, toiled the iron horse, stopping often for his wooden forage and his water; on past Chìta, whose 9 regiments of Trans-Baikal Cossacks are watering their steeds in Manchûria; past Mogsdon, where we dined (!) at 1 a.m. on the 18th; past Verkné-Udinsk, also deprived of its warriors; to Missováia, on the east shore of Lake Baikal. Here we arrived at 4.50 p.m., on the 19th of July. Trans-Baikalia, though not to be compared in richness with Manchûria, is a favoured country with green steppes covered with horses, flocks, and herds; tended by pig-tailed Buriâts. Midst vast forests of conifers and deciduous trees rolls the stately Selengà, on its way to feed the waters of Baikal. The journey from Manjûrie station to Missováia occupied 70 hours. There was but little food to be obtained on the way; but enough to live on, which was scarcely the case between Port Arthur and Harbin. Across Baikal we steamed in four hours, and slept on board the steamship "Angarà" (built by Armstrong), until 6 a.m.; when we disembarked, entered the train, and arrived at Irkûtsk at 10.30 a.m. on the 20th July. As we left Port Arthur on the 10th and were detained 24 hours en route, we did the journey in ten days. The whole distance is nearly 2,000 E. miles.

CAMPAIGNS AGAINST INDIA FROM THE WEST AND THROUGH AFGHÁNISTÁN.

Translated and condensed from the Russian of Major-General L. N. Soboleff, by Lieut.-Colonel W. E. GOWAN, Retired, Bengal Army.

(*Continued from April* JOURNAL, *p. 405.*)

Nádir-Sháh's victory at Kandahár being completed, in order to reward his troops for all the labours and privations which they had undergone during the lengthy siege he made over to them the whole of the immense wealth, which the Afghans had been collecting for some years at this place. He then razed to the ground the ruins of the old fort and city, and made Nádir-ábád or "New Kandahár," the headquarters of the administration. Furthermore, he removed from the province any persons whom he had reason to believe might prove hostile to his cause, and in their place introduced Afgháns of the Abdáli tribe whom he brought from Nishapur and other parts of Khurásan.

By the 23rd March (4th April) the exiles had been conveyed across the Argandáb river. As regards those of the Ghilzais, who had proved faithful to him, he used every endeavour to ingratiate them, by courteous bearing, by rewards, by advancement, and, above all, by the promise of loot. He also appointed from amongst these same Afgháns, governors of Kalát (Biluchistán), Kila-Bist and Zamindawár, and he formed, out of the strongest of the young men of the tribe, a body of cavalry. And, in accordance with an order which he had already issued to the effect that no Mussulmán was to remain in slavery, he released every man, so bound, and restored him to his family.

In his relations with India at this time, Nádir-Sháh employed emissaries of two kinds: official envoys whom he sent to the Emperor, and secret agents, who were instructed to visit any person of rank, who was known to be more or less disaffected towards the Imperial Court of Delhi. Although Nádir-Sháh's historian, Mirza-Mehdi, in his account of the doings of these official envoys, makes no mention of the secret negotiations conducted through other persons, they of course had the most far-reaching influence on the state of affairs in India at the time.

It would seem that before advancing against Kandahár, Nádir-Sháh had sent an envoy, named Ali-Mardán, to the Emperor of India with a letter to say that it was his intention to take Kandahár, and asking him to issue orders to the ruler of Kábul, as a vassal of India, not to entertain any fugitive Afgháns. Although Muhammad-Sháh had sent a friendly answer to this communication, intimating

not only his assent to Nádir-Sháh's request, but stating that he had placed a certain sum of money at the disposal of the frontier authorities so that they might enrol a body of troops to prevent any violation of the boundary by Afghán fugitives, yet at the very beginning of the siege of Kandahár, a body of Afgháns, who had escaped from that city, had been allowed to enter Kábul. Nádir-Sháh then sent another envoy to the Emperor of India to remind him of his promise of neutrality, but he, at the same time, very well knew that Muhammad-Sháh had done nothing whatever to meet his first request. This circumstance without doubt was well-pleasing to Nádir-Sháh, for it gave him a ready pretext for inculpating the Emperor of India with a breach of friendly relations. And so, on the 21st April (3rd May), he sent off a third envoy, a Turkumán, named Muhammad-Khán, to demand from Muhammad-Sháh a full explanation as to his breach of promise. This envoy was ordered to proceed by the Sind route, through the Bolán Pass, and he had instructions not to remain in India more than 40 days. He was also to require of Muhammad-Sháh a specific answer to all his Sovereign's demands. On the arrival of this envoy, the Emperor of India, after hearing the nature of his mission, put him off from day to day, and would appoint no date for his final audience. A year thus passed, and still Nádir-Sháh's envoy did not return.

As soon, therefore, as he had captured Kandahár, Nádir-Sháh sent three persons of rank, one after the other, with a demand that his envoy should be allowed to come away, and that he should be given a definite answer to his *ultimatum*. As he received no answer, he considered himself free to adopt hostile measures against India. He, therefore, ordered his troops to cross the frontier, and to march on Ghazni. The territory of the Emperor of India extended, at this period, as far as Mukkur. At Kárabágh, 20 miles from Ghazni, Nádir-Sháh pitched his camp, and sent from thence a body of troops, under the command of his second son, Nasr-Ullah-Mirza to subdue the Afgháns of Ghurband and Bámián.

By this turning movement round Ghazni and Kábul, Nádir-Sháh had in view the linking up of his own force with that of his eldest son, Riza-Kuli-Mirza, who had, as we know, after operating along the northern slopes of the Hindu-Kush range, concentrated his force at Bálkh.

Ghazni surrendered without a struggle, and on the 22nd April (4th May) was occupied by Persian troops. In order to secure his left flank, Nádir-Sháh then sent a force into Hazaristán, the mountainous country to the west of the Kandahár-Kábul road, and having brought the Hazáras into subjection, he formed out of them a valuable contingent for service in the ranks of his army. And he did the same with the Afgháns inhabiting the country round Ghazni. After this he marched straight on Kábul, distant 84 miles. On his arrival, although he met with no general opposition, certain of the tribal leaders were indisposed to yield without a struggle, and they therefore shut themselves up in the citadel. Accordingly, on the 2nd (14th) May they attacked a Persian fatigue party, which had been sent on ahead to select an encamping ground about 3 miles to the east of the city. This attack was beaten off, but the next day the Afgháns again issued forth in considerable numbers, and having attacked a body of Persian scouts, were charged by Nádir-Sháh's cavalry and compelled to take refuge behind the walls of the citadel.

The same day the investment of Kábul was completed, and after a weak's heavy bombardment, the city was compelled to surrender. Meanwhile, Nasr-Ullah-Mirza, who had been sent to occupy Zokhák, Bamián and Ghurband, was brilliantly carrying out his instructions, and by the 23rd May (4th June) he rejoined his father at Kábul marching *viâ* Charikár, which lies about 37 miles to the north of the Afghán capital.

Thus the conquest of Northern Afghánistan was carried out in a very short time, and its population became subject to the invader. Moreover, the ranks of Nádir-Sháh's army had been considerably increased by the addition of Afgháns, Hazáras, and Uzbaks.

That Nádir-Sháh, like all the great conquerors of Central Asia, had always nourished ambitious designs respecting India, cannot be open to any sort of doubt. But as a man of deep designs, skilful, crafty, and stealthy, he did not reveal these plans until he had first of all conquered Bálkh and Afghánistán, as he reckoned that, once he had securely possessed himself of Bálkh (the key of the Hindu-Kush passes), Kandahár, Ghazni, and Kábul, he could, with some hope of success, undertake a campaign in the valley of the Indus. Moreover, he hoped to have the warlike Afgháns as allies in his invasion of India. To this end he first of all inflicted on them severe chastisement, and then made much of them, and so induced them to enter the ranks of his army. One so deeply versed in Asiatic character could not act otherwise.

He now decided that his carefully projected campaign should no longer be deferred. At the same time, being desirous that history, the value of which, as a critic, he thoroughly recognised, should not accuse him of being a mere useless shedder of blood, but should rather recognise in him a skilful "player of the game," he endeavoured once more to open negotiations with the Imperial Court of Delhi. Accordingly he sent to that corrupt Court yet another envoy entrusted with a letter to Muhammad-Sháh. In that letter he reminded the Emperor of India that he had not kept the promises which he had given, that he had not merely failed to give any reply to the demands that had been made, but he had detained the envoy through whom these demands had been made, thereby evincing disdain, which could not but destroy all traces of the ancient friendship that had subsisted between the two Courts, and at the end of the letter he added this assurance:—"Generally speaking, we had no other object than the punishment of the Afgháns, but, on account of our victory at Kandahár, these same Afgháns, having become more dangerous to India than they are now to Persia, we, supposing that our action would be agreeable to your Majesty, desired to punish those of the same race at Kábul also, but, in so doing, instead of receiving the submission of the inhabitants of that city, we have met with opposition of all kinds. Nevertheless *we still desire the continuation of the friendly relations, which have so long existed between us.* On the 24th May (5th June) the envoy, bearing this communication, attended by many of the leading men of Kábul, set out for Delhi.

Meanwhile Nádir-Sháh continued his preparations for the invasion of India, and in order to arrange that his army should be provided with a sufficient supply of provisions, after leaving a garrison at Kábul, he marched on the 10th (22nd) June, with the rest of his troops in a northerly direction towards Charikár, Bagráda, and Saf, where there was an abundant supply of water, forage, and grain.

This movement induced the inhabitants round Kábul to again offer opposition, but as soon as Nádir-Sháh's troops had successfully assailed all their mountain strongholds, they saw that further resistance was useless, and accordingly tendered their entire submission, whereupon Nádir-Sháh formed another strong body of auxiliaries from amongst them. At this time an event occurred at or near Jalálábad which greatly favoured the development of Nádir-Sháh's plans. The deputy from the Emperor of India, who was escorting the Persian envoy on his way back to Kábul, incited the Afgháns of his suite to kill him on the road. Although Nádir-Sháh, on the receipt of this news, was with his main body, 22 days' march to the north of Kábul, by the 17th (29th July) he had despatched a strong force to Gandamak, but he himself remained at Kábul, where, on the 21st July (2nd August) he was joined by a strong body of Hazáras. An advanced party was then pushed forward for the occupation of Jalálábád, which lies about 105 miles to the east of Kábul. On the 30th July (11th August) this town surrendered without offering any opposition, but the governor, with a strong body of Afgháns, having taken up a fortified position in the mountains, resolved to offer resistance. This stronghold was at once attacked and captured by the Persian troops, and the whole of its defenders were put to the sword.

We may here mention that when Nádir-Sháh had decided to begin his march towards India, he sent an order to his eldest son, Riza-Kuli-Mirza to hand over the town of Bálkh to some fit person, and after leaving there a sufficient force for the preservation of his authority, to rejoin him at Kábul with the rest of his troops, and he also directed him to come by the shortest route through Bámián and Zokhak.

But either Riza was delayed on the way or he came by some other route, in any case by the time he reached Kábul his father had already left. By what pass then did Riza cross the Hindu-Kush range? This a very interesting question, and one which is not answered by Nádir-Sháh's historian. We ourselves have reason for supposing that Riza crossed by the Shibr pass, for we bear in mind that Nádir-Sháh had taken special care to thoroughly bring into subjection the inhabitants of the Ghurband valley, and that for three weeks he had encamped his army in the immediate neighbourhood of this valley.

After leaving his *impedimenta* at Kábul, Riza pushed on, and rejoined his father on the 18th (30th) of September. The next day Nádir-Sháh began a most searching inspection of the troops which had joined him from Bálkh. We do not know either the numerical strength of the composition of Riza's force, but Nádir-Sháh's historian tells us that the inspection lasted for several days, and that his master, perceiving that many of the horses were galled, and showed other signs of unfitness, made arrangements to supply his cavalry with horses of Arab blood from his studs. The troops were also furnished with new muskets. This circumstance, as recorded by an eye-witness, shows what a degree of personal attention Nádir-Sháh paid to his armed forces.

On the 25th September (7th October) Riza-Kuli-Mirza was appointed Viceroy of Irán (Persia) and Nádir-Sháh with his own hands placed on his son's head an Imperial diadem, and gave him the right to wear an aigrette, not on the left side, but on the right of his turban, a distinction ordinarily permitted only to the reigning Sháh himself. Two days afterwards the newly-appointed Viceroy

was sent off to his new post, going on his way with all befitting pomp and outward manifestation of regal splendour, and the next day Nádir-Sháh's main body, now considerably augmented by fresh troops, moved forward towards Jalálábád, where, on the 4th (16th) October camp was pitched to the east of the town.

It was here that, according to the testimony of Mirza-Mehdi, another body of Afgháns, some 12,000 in number and well tried in battle, joined the invader's ranks, thus affording proof that the men of this race are at all times ready to take part in the pillage of rich Hindustán.[1]

Such were the military operations that preceded the invasion of India by Nádir-Sháh, and this masterpiece of careful preparation for a great campaign will bear the strictest criticism. This great conqueror of India, indeed, left nothing out of sight, however apparently trivial, in order to gain complete success. The extreme caution which he exercised in his operations against the Afgháns was most marked, but this caution, which often seemed characterised by undue slowness of movement, was fully justified by subsequent events. In his Afghán campaign, indeed, it may be said, that Nádir-Sháh moved with measured step, that he was extraordinarily alive to the safety of his troops, that he would never decide upon storming fortified positions, except in cases of the utmost necessity, and that he never stinted the use of his artillery projectiles. Nevertheless, whilst thus slowly subduing, step by step, races and tribes, he was all the time carefully selecting and training the young and able-bodied of the peoples whom he conquered for service in the ranks of his army. And this measure had a two-fold effect, for whilst, on the one hand, it increased the numerical strength and power of his own forces, it weakened those of the peoples whom he had necessarily to leave in his rear.

So that whilst in his campaign in Afghanistán, Nádir-Sháh displayed the greatest circumspection of a talented army leader, in his operations in the plains of India he disclosed another side of his military genius, for with one blow he shattered the strength of the Indian Empire, and the power of the dynasty of the house of Timur.

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Here we must leave the narrative of Nádir-Sháh's advance against India for a time, and briefly review the state of affairs in that country at the same period.

We have already said that when Nádir-Sháh conceived the idea of a campaign against India, Muhammad-Sháh was on the throne of that vast Empire, but it was after the death of the famous Aurangzib[2]

[1] Here we would point to the remarkable fact, repeated with every successive campaign against India, *that an invading army, not only does not decrease in numerical strength, as it draws near to India, but rather almost always gains accession of numbers.* And this arises from a very simple cause: the warlike races, inhabiting the mountainous country contiguous to India, look upon that rich country as a source of great gain. This has ever been the case, and in all probability it will be so in any fresh campaign from the west.—*Author.*

[2] Aurangzib died at Ahmednagar on 21st February, 1707 A.D. (Fraser). —W.E.G.

that the period of disorder really began to set in all over the land. Thus, in the course of eleven years, six Emperors[1] sat upon the throne of Delhi, and all of them were mere puppets in the hands of the party which was, for the time being, in the ascendant. Muhammad-Sháh himself was only placed upon the throne by the all-powerful Syeds,[2] who regarded him as one possessed of a sufficiently weak character to enable them to rule the Empire in his name. But, to their complete surprise, their nominee began to take up a line of his own, and this led to the overthrow of the two brothers, and to the ultimate murder of one of them. In view of such a beginning of his reign, people not unnaturally supposed that Muhammad-Sháh would seize the reins of administration with a firm hand, and would bring back peace to the Empire. But this was a complete delusion. Altogether satisfied with his temporary triumph over his mentors, Muhammad-Sháh gave himself up entirely to sloth and sensuality. One Khán-Dorán, one of the murderers of Syed Hussain-Khán, and an intriguing subtle individual, became his favourite, and was appointed *Mir-Bakhshi*, or Paymaster-General and Treasurer of the Imperial forces, receiving the title of *Amir-ul-Umra*, a position and rank which virtually made him the chief official of the State. All appointments, and the issue of the emoluments thereof, were in his hands, and he made skilful use of this power to establish his own authority. Still, he comported himself with such circumspection that his every act was veiled beneath "the order of the Emperor." Muhammad-Sháh placed complete confidence in him, listened with satisfaction to his secret calumnies, and was, in fact, subject to him in all matters. Consequently, within a very short time, this man obtained undisputed power, and began to rule the Empire just as he pleased. And when Muhammad-Amin-Khán died, his son Kamar-ud-Din-Khán was appointed to succeed him in the office of *Wazir* or Prime Minister. He was a young man entirely given to excesses of every kind, and Khán-Dorán allowed him every opportunity of gratifying his propensities in this direction. Moreover, such were the weakness and indolence of Muhammad-Sháh that he avoided any interference with the working of so important a post as that of Prime Minister. Hence the governors of the several provinces, being extremely exasperated at seeing the reins of the Empire passing out of the hands of the sovereign into those of powerful Court favourites, began to fall away from their allegiance to the throne, and to endeavour to set up their own independence. And, besides this, the foes of Mussulmán dominion—such as Rajpúts,

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[1] 1. Muhammad-Mauzim (second son of Aurangzib, who reigned for six years with the title of Kutub-ud-Din-Bahádur-Sháh.

2. Mauz-ud-Din, eldest son of the foregoing, who reigned for a brief period.

3. Muhammad Farrukh-Sir, nephew of (2). He was murdered after a reign of seven years.

4. Rafi-al-Dirját, son of Rafi-al-Shán, murdered after a reign of about three months.

5. Rafi-al-Daulat, son of Rafi-al-Shán, died after a few days' reign.

6. Muhammad-Sháh, son of Jáhan-Sháh, reigning at the time of this narrative (Fraser).—W.E.G.

[2] Two brothers, named respectively Abdullah-Khán and Hussáin-Khán (Fraser)—W.E.G.

Mahrattas, and Játs—also took advantage of the weakness of the titular occupant of the throne, and displayed open hostility towards the Central Government. Recognising the dangers which threatened the State on all sides Khán-Dorán considered it necessary to forcibly prevent any further overt acts of disloyalty or sedition on the part of the enemies of the Empire, and with this idea he began to collect bodies of troops, but then it immediately occurred to him that if he placed himself at the head of any one body, and marched in a given direction, his own position at Court might become imperilled, for, in his absence, the Emperor might very well fall into the hands of his rivals. And so he did all he could to induce his sovereign to place himself at the head of his army, but all his arguments to this end proved futile, since Muhammad-Sháh had no desire to change the voluptuous life of the *harem* for the dangers and anxieties of the battle-field. And so, in 1721 A.D., the Rajputs swooped down on Ajmere and, after devastating this part of the country, made their way into the provinces nearer to the seat of the Imperial government. At the same time the Mahrattas, after ejecting the Mussulmáns from Gujerát, set up their own rule in the Malabar littoral.

Whereupon Chin-Kalej-Khán, son of Ghazi-ud-Din-Khán, who had received the title of the *Nizám-ul-Mulk*,[1] and who was the *de facto* ruler of the Deccan, took every advantage of these disturbances. Under the pretence of holding the various Rájahs and Mahratta chiefs in check, he got together a powerful army and, having done this, he began to use it; he also discontinued to send tribute to the Emperor, and he opened secret negotiations with the Mahrattas, whereby he permitted them to pillage the Imperial provinces with impunity. Nevertheless, although this rampant disorder was rending the Empire, Muhammad-Sháh, instead of using force to counteract the plot of his enemies, contented himself with feeble efforts to come to terms with the rebels. Thus he ceded Ajmere to Ajit-Singh, and yielded to the Mahrattas the right of exacting a fourth part of the revenue of the province of Gujerát. He then sent an invitation to the Nizám to appear at Court, but this wide-awake individual very well understood what treatment he might expect at the hands of his sworn enemy, Khán-Dorán, towards whom he, too, nourished a bitter hatred. And so, although he obeyed the summons, he took with him 20,000 of his troops. This was in the year 1723 A.D. At his interview with the Emperor, Nizám presented to him a picture of the vicious behaviour of the whole lot of the Court officials, and, in powerful language, warned them of the dangers which threatened the Empire. He advised him to substitute for the mal-administration of persons, who were leading the Empire to destruction, his own individual authority. Historians tell us that Muhammad-Sháh, stirred by the deep truths contained in the advice given to him, really intended to follow the Nizám's wise counsel. If this was the case, such a good intention lasted no longer than a mere momentary impulse. In any case, the intimates and *quasi* ministers of this weak Emperor once more befooled him with their chatter, and once more he gave himself over to hopeless inactivity and sensual enjoyment. Ashamed of the company of such vicious folk, the aged Nizám left the Imperial Court under the pretext of pacifying the Mahrattas.

[1] *i.e.*, "He who arranges and puts in order the Empire," (Fraser).—This title became, with this recipient, hereditary, and the Chief Muhammadan Feudatory Prince of India still bears it.—W.E.G.

This, of course, was a mere excuse, because, as regards the Deccan, had any disturbance taken place there, a mere hint on his part to the Mahratta leaders would have been sufficient to bring it to an end. Moreover, in the Nizám's absence, his very capable son, Ghazi-ud-Din (so named after his grandfather) was controlling affairs, so that his father's departure from Delhi, without the Emperor's permission, was all the more remarkable an evidence of his own power and of Muhammad-Sháh's utter helplessness.

But before these events, the Nizám had concluded a treaty with Sahu, or Shaoji, son of Sumbhaji, and grandson of Sivaji, the Mahratta leader, whereby the latter had undertaken, on the first summons, to march a force straight on Agra. He had also bound himself to support this movement by a diversion on the Nerbudda.

Truly were the affairs of the Imperial Court of Delhi in the most lamentable condition. On the west a bloody struggle had been raging between the Persians and the Afgháns, and this had only terminated in the subjugation of the latter, and in the advance of Nádir-Sháh on India. Towards the south the Mahrattas, at whose head stood the dangerous Nizám himself, were threatening the very existence of the Empire. On the east the English, the future possessors of the Empire, raised by six worthy scions[1] of the great house of Timur, had been in the occupation of Calcutta since the year 1686 A.D. And, lastly, at the time whereof we now write (1730 A.D.), the Nizám was inviting the Mahrattas to carry out the undertaking to which they were bound. Unspeakably overjoyed at the receipt of such a summons, these marauders at once pushed forward to "the great pillage" under the command of the famous Bajirao. They soon overran Gujerát and Málwa, and although the Mussulmán governors offered the most determined opposition, they received no support from the Imperial Government, and perished nobly on "the stricken field." It is related that the governor of Málwa (Gwardir Bahádur), before his death, used the following words: "If they would but support me, I will stake my head that I will arrest the progress of the Mahrattas; but if they allow me to perish without any help, these barbarians will carry the war to the remotest bounds of the Empire." And his prophecy was fulfilled, for not long afterwards the Mahrattas reached Agra and pillaged the country round.

Hence nothing now remained to the vicious imbeciles at the Court of Delhi but to take up arms if only to defend themselves. And so, at last, the Imperial forces were sent against the Mahrattas, under the command of the Wazir's brother. But these *Indian Cossacks* (a term which we may justly apply to these same Mahrattas), following their usual tactics, avoided all direct encounters, surrounded the forces of their enemy on all sides, and ceaselessly harassed them with minor engagements. For several months the Imperial forces did nothing but carry out useless marches and countermarches, and then returned to Delhi!

In 1734 A.D. the Mahrattas once once made their appearance in the heart of the Empire. After reaching Agra, *viâ* Gwalior, they

[1] Mr. H. G. Keene quotes an American author, who says:—"I doubt if the annals of any family, that ever reigned, can furnish six successive monarchs comparable in the greatness of their endowments, and the splendour of their rule, to Bábar, Humáyun, Akbar, Jahángir, Sháh-Jahán, and Aurangzib."—W.E.G.

carried out terrible devastations, and then retired as soon as the Imperial forces appeared against them. Soon afterwards, however, they crossed the Jumna and turned towards the rich province of Oude, but here they were met by a man of a different stamp from the ordinary type of Khán-Dorán's favourites. Besides being an experienced soldier, Saadát-Khán had at his disposal a well-disciplined force, the best indeed at the time in India. Moreover, he managed to manœuvre the Mahrattas into a trap, and their line of retreat being cut off, they had, *nolens-volens*, to fight in order to get out of it. In this engagement they suffered terribly, 5,000 of them being slain, and a larger number still perished in their retreat across the Jumna. But a small remnant managed to get back to Gwalior, where Bajirao awaited them with the rest of the band. This was in the year 1735 A.D.

As soon as the news of Saadát-Khán's signal victory reached Delhi, the Imperial Government thought it time to move out a force to complete the discomfiture of the Matrattas. *But every man sent was on foot*! Meanwhile, Saadát-Khán was pressing hard upon the heels of his enemy, being of course desirous of driving them completely out of Imperial territory. He was close to Gwalior when he suddenly received an order to await the arrival of the Imperial forces, that were tramping along in a leisurely manner from Delhi! Well can we imagine his chagrin on the receipt of such a message, for of course he realised that the Mahrattas would then be enabled to get out of their extremely difficult position. Here, however, something of the nature of that, which is least expected, took place, for directly the Mahratta leader heard that Delhi had been cleared out of every available soldier, he mounted some of his men on the best horses he had, and by a circuitous route made for the Imperial capital. And so in three days, the Mahrattas were burning and pillaging in the very outskirts of Delhi! The Emperor, trembling with terror, at once shut himself up in the palace, and the inhabitants, also overcome with alarm, were on the point of opening the city gates to the marauders, when fortunately Saadát-Khán, accompanied by Khán-Dorán and Kamur-ud-Din-Khán, once more reappeared upon the scene with a sufficient force. Although, in the fight which ensued, the Mahrattas were driven off, they only withdrew to a more favourable position, and were then again prepared to renew their hostile operations. Saadát-Khán, though he was on the spot, could not prevent Khán-Dorán, and the Wazir (who feared to risk their positions at Court by entering upon a further struggle with the enemy), from opening peace negotiations. And as a result of these, they ignominiously consented to hand over to the pillagers of the Empire a fourth part of the revenues of Agra and of Delhi, and of the country appertaining to these provinces, provided that they would withdraw from them altogether. Thus it came to pass that the victors in the fight actually paid a large yearly contribution to the vanquished, for peace and quiet's sake! Saadát-Khán, now thoroughly indignant at this display of impotence and cowardice on the part of the Imperial Government, returned to Oude without even deigning to take leave of the Emperor.

Meanwhile, Nizám-ul-Mulk, ruler of the Deccan, was vigilantly watching the progress of affairs northwards, and in his own province he was so skilfully looking after his own interests that he at last induced the inhabitants of the Deccan to acknowledge him as their lawful sovereign. Muhammad-Sháh and his ministers, being now

reduced to the depths of despair at the too evident disruption of the Empire, could think of nothing better than to turn once more for succour to the Nizám, and they, therefore, again invited him to come to Delhi. Although he delayed not in answering this second summons, he soon became so enraged at the intrigues of his enemy Khán-Dorán that he bound himself by an oath to avenge himself, and to this end he began to open negotiations with Saadát-Khán, negotiations which had for their object a joint plot against the Empire. As soon, therefore, as their plans were completed, the two conspirators decided to invite Nádir-Sháh to invade India.

This invitation came upon its recipient with no surprise for he had been following with keen gaze all that was taking place in that rich, but distracted country, and he was well acquainted with the weakness and incapacity of the Emperor. Indeed his secret agents had long been at work all over the Indian peninsula, but as a shrewd judge of men and of their weaknesses, he thought it well to pose as one for whom the suggested campaign had no particular attractions. In his answer, therefore, to the invitation, which had been sent him, he pointed out that it would be extremely difficult for him to force his way to Pesháwur, because Nasir-Khán, having been the worthy ruler of that province for more than 20 years, naturally possessed great personal power in it, power which was, moreover, backed by a large army. He also observed that even were it possible to overcome this powerful ruler and to occupy his province, the invading army would still have in front of it the five large rivers of the Punjáb, and that the ruler of Lahore, would undoubtedly offer strong and effective opposition to his army under these circumstances. He, however, added that, if all these obstacles could be surmounted, he was ready to enter upon a struggle with the Emperor's forces. To this cautious communication the Nizám and Saadát-Khán replied that they had already gained over to their side the rulers alluded to, and that, in any case, at least half of the Imperial forces were at their disposal.

This then was the terrible condition of affairs in which the Emperor of India found himself when Nádir-Sháh's formidable army had advanced viâ Ghazni to Kábul. We now know, therefore, that although Nádir-Sháh's lengthened halt at Kábul is to some extent to be explained by the slow movements of the forces under his son, Riza-Kuli-Mirza, yet it was at this very time that Nádir-Sháh himself was engaged in final negotiations with the two conspirators in India with the object of securing facilities for his projected military operations in the Punjáb. It must, of course, be remembered that these negotiations were conducted with the greatest secrecy, and that the unfortunate Muhammad-Sháh had no suspicion of the treachery that was at work. It also remains to be observed that the fact of the protracted halt of Nádir-Sháh's army in the neighbourhood of Kábul is possessed of a great significance in another sense, viz., *that in the valley of the Kábul river, especially in its upper course, which is immediately adjacent to the Hindu-Kush range, there is an abundant supply of forage and grain, sufficient to meet the requirements of a large army.* This fact is open to no sort of doubt, inasmuch as it was manifested during the campaigns against India of Chingiz-Khán, and of Tamerlane, (Timur Lang) when the local resources of the Kábul valley sufficed for the huge armies of these famous leaders. (*To be continued.*)

NAVAL NOTES.

HOME.—The following are the principal appointments which have been made: Rear-Admiral—C. J. Barlow, D.S.O., to be Second-in-Command of the Home Fleet. Captains—T. H. Jerram to "Russell"; H. G. King-Hall, D.S.O., to "Endymion"; F. R. Pelly to "Asia"; G. A. Callaghan, C.B., to "Prince of Wales"; J. de M. Hutchison to "Glory," additional; F. St. G. Rich to "Hood"; F. C. Tudor to "Challenger"; R. A. J. Montgomerie, C.B., to "Impregnable"; A. W. Ewart to "Doris"; C. H. Robertson, C.M.G., to "Theseus"; W. B. Fawckner to "Iphigenia"; Commander—F. W. Kennedy to "Medusa."

Rear-Admiral C. J. Barlow, D.S.O., who has been appointed to succeed Rear-Admiral E. Poë, M.V.O., as Second-in-Command of the Home Fleet, hoisted his flag on the 9th inst. on board the first-class battle-ship "Royal Oak," at Devonport.

The new first-class battle-ship "Queen," which commissioned on the 7th ult. for the Mediterranean, left on the 16th ult. for her destination. The first-class cruiser "Endymion," commissioned at Chatham on the 20th ult. for service with the Channel Fleet. The new first-class armoured cruiser "Lancaster" commissioned at Chatham on the 5th ult. for service in the Mediterranean; she is, however, temporarily to take the place of the first-class armoured cruiser "Bedford," in the Channel Fleet, which in her turn is transferred to the Home Fleet. The second-class cruiser "Diana," arrived at Plymouth, on the 5th ult. and paid off on the 12th inst. at Chatham. The second-class cruiser "Iphigenia" commissioned at Portsmouth on the 12th ult., to relieve the second-class cruiser "Talbot," in China, and left on the 27th ult. for her destination. The second-class cruiser "Intrepid" arrived at Plymouth from the Mediterranean, and paid off on the 9th inst. at Portsmouth. The second-class cruiser "Amphion" arrived at Plymouth on the 24th ult. from the Pacific, and will pay off at Devonport. The new sloop "Cadmus" commissioned on the 13th ult., at Sheerness, for service in Australia, where she will relieve the first-class gun-boat "Lizard," and left on the 22nd ult. for her destination. The third-class cruiser "Blanche" arrived on the 14th ult. from South Atlantic station, and will pay off at Devonport.

The Disaster to Submarine "A1."—This unfortunate vessel, which was sunk at Spithead on the 18th March, was successfully raised at 11 a.m. on the 18th ult., after long delays caused by the bad weather, and at 8 p.m. was placed in the deep dock in the dockyard at Portsmouth. The remains of her late officers and crew were interred at the Naval Cemetery, Haslar, with full naval honours, on the following afternoon.

Launches.—The new first-class armoured cruiser "Devonshire" was launched on the 30th ult. at Chatham dockyard. Her principal dimensions are as follows:—Length between perpendiculars, 450 feet; beam, 68 feet 6 inches; draught, forward, 24 feet 3 inches; draught, aft, 25 feet 3 inches;

freeboard, forward, 20 feet 6 inches; freeboard, amidships, 14 feet 6 inches; freeboard, aft, 16 feet, with a displacement of 10,745 tons. The first keel-plate of the "Devonshire" was laid on March 25th, 1902, but her construction was delayed for some time in consequence of alterations being made in her design.

The principal protection to the vessel will be afforded by a belt of armour extending along the ship's sides for a length of 295 feet, from 6 feet 6 inches above the water-line to 4 feet 3 inches below. The thickness of this armour, which is of hard steel, varies from 6 inches to 4½ inches. The armour bulkhead at the after end of the belt is 4½ inches thick, and the protective plating on the bow 2 inches thick. The four barbettes are circular in plan, protected by hard steel 6 inches thick, while the fore conning tower has 10 inches hard steel armour. The whole of this armour was manufactured by Sir W. G. Armstrong, Whitworth & Co. The casemates for the 6-inch guns on the main and upper decks have 6-inch armour. The plates at the back are 2 inches thick. The main deck plating from the stem to the armour bulkhead is worked in two thicknesses, each of ½ inch before station 23, and ⅜ inch each abaft. Over the engine room a third thickness of ¾ inch is worked. On the lower deck from the stem to the armour bulkhead is worked two thicknesses of plating, each of ⅜ inch in thickness, and abaft the armour bulkhead there are two thicknesses of 1 inch thick.

The armament consists of four 7·5-inch Q.F. guns on turntables in the circular barbettes, with all round loading mountings by Sir W. G. Armstrong, Whitworth, & Co. The guns are protected by shields, having 7½-inch, 5½-inch, and 4½-inch armour, with 2 inches on the floor and crown. There are also six 6-inch Q.F. guns, four on casemates on the main deck, and two in casemates on the upper deck, together with one 12-pounder on the upper deck, one 12-pounder field gun on the upper deck, twenty-three 3-pounder Hotchkiss guns on the upper deck, fore bridge, and after shelter, and two ·303 Maxims on the upper deck. The after, main, and upper deck casemate guns have a fire direct aft. It may be pointed out that the vessel was originally designed to carry two 7·5-inch guns and ten 6-inch guns, but it has been decided to add two more of the heavier weapons, and reduce the number of 6-inch guns by four. There are two submerged tubes for firing 18-inch torpedoes forward. The ship will carry nine 18-inch torpedoes and four 14-inch, the latter for firing with dropping gear from the ship's steam pinnace.

The contractors for the machinery are the Thames Ironworks Shipbuilding and Engineering Company. The engines, which are to develop 21,00 I.H.P., will consist of two sets of inverted four-cylinder triple expansion engines, working at a pressure of 250 lbs. per square inch in the H.P. slide case. The cylinders are arranged to suit the Yarrow, Schlick, and Tweedy system of balancing. The four main condensers are of brass. There are also in the engine-rooms four evaporators, four fire and bilge pumps, each capable of discharging 100 tons an hour, four main centrifugal pumps, each capable of discharging 1,200 tons of water an hour from bilge, twin air pumps, two steering engines, and two starting engines. The boilers consist of 22 Niclausse, fitted in three boiler rooms, and six cylindrical boilers, fitted in a fourth room. Fourteen of the Niclausse boilers will have 15 sections, six with 14 sections, and two with 12 sections, each section having 22 tubes, the safety-valves being loaded to a pressure of 210 lbs. per square inch. Each of the cylindrical boilers is of 13 feet external diameter, 10 feet 6 inches long, and has three corrugated furnaces

3 feet diameter in the clear, and is arranged to work with closed ashpits and heated air supply (on the Howden system). The safety-valves are loaded to 210 lbs. per square inch. It is estimated that a speed of 23 knots will be obtained. The steering gear is of the screw type, and there are two steering engines, one in each engine room, having separate steam and exhaust pipes. Either engine is of sufficient power to put the rudder from hard over to hard over (or through 70°) in 30 seconds, when the ship is proceeding at full speed. There are four positions from which the ship can be steered—namely, fore bridge, conning tower, platform deck forward, and steering compartment on platform, deck aft, close to the wheels for steering by hand.

There are two sets of air-compressing pumps situated on the platform deck forward for charging and ejecting torpedoes. For working the 7·5-inch guns there are four hydraulic pumps. The ship will have 22 fans, 16 steam for ventilating the boiler rooms, and six, electrically driven, for ventilating the engine rooms. She will be fitted with two steel masts, each carrying a searchlight platform. She will have striking topmasts standing 120 feet above the water-line, with a truck semaphore at the main, and a multiple fibre flashing-lamp at the fore. The boats number 12, including one 56-foot steam pinnace, one 40-foot steam pinnace, and one 42-foot launch. The stem, stern-post, rudder-frame, shaft brackets, etc., are steel castings; the stem, which weighs 11¼ tons, being cast in one piece. The stern-post is cut away aft to increase manœuvring power The weight of the vessel when launched will be about 5,735 tons.

The "Sentinel," the first vessel of the new scout class, was launched on the 19th ult. from the shipbuilding yard of Vickers, Sons, and Maxim at Barrow. The "Sentinel" is 360 feet long, 40 feet beam, and has a mean draught of 14 feet 2 inches. Her displacement at that draught is 2,920 tons; her estimated H.P. is 17,000, and her maximum speed with forced draught, is to be 25 knots on the contractors' trial in smooth water. The armament consists of ten 12-pounder and eight 3-pounder Q.F. guns. Her coal capacity is 150 tons, which is estimated to give her a coal endurance of 4,000 miles at cruising speed, but will of course give her a much smaller radius of action at full speed. Her total estimated cost is given in the Navy Estimates at £276,384, which is approximately the cost of the second-class cruisers of the "Talbot" class, with a displacement of 5,600-tons, and a speed of 19 to 20 knots. She will have a complement of 286 men. A feature of the vessel is an ammunition passage under the upper deck, which gives the crew transporting the ammunition from the magazine to the guns the protection of the shell plating, and the coal in the bunkers. There are 12 boilers, arranged in three watertight compartments.— *Times.*

Steam Trials.—During the last week in March the new first-class battle-ship "Swiftsure" (ex-"Constitucion"), built at Elswick, originally for the Chilian Government, by Sir W. G. Armstrong, Whitworth & Co., carried out successfully her speed, gunnery, and torpedo trials. After leaving dock at Chatham, 1,000 tons of coal were put on board the vessel, and water ballast was added until the draught of the vessel reached 24 feet 10 inches, or 4 inches in excess of her normal draught. The thirty hours' duration trial began on the 25th March, and throughout this trial the engines, by Messrs. Humphrys, Tennant & Co., ran at 130 revolutions, and developed an I.H.P. of 8,700, or just over three-fifths

of the contract power. During the trial a considerable sea was running, with a fresh easterly breeze. Four runs were made on the measured mile off the mouth of the Tyne before the conclusion of the trial, and these runs gave a speed of over 17·5 knots, the revolutions being slightly above 130, and the I.H.P. 8,670. The air-pressure in the stokeholds during the thirty hours was *nil*. The ship was anchored off the Tyne until the morning of the 29th March, additional water ballast having been taken on board during the interval. The six hours' full speed trial was then begun, with the vessel at a draught of 24 feet 7½ inches. During the six hours' trial, six consecutive runs with and against the tide were made over the measured course; the mean speed of these runs worked out at 20·05 knots, with 151 revolutions, I.H.P. = 13,470. The mean I.H.P. during the whole of the six hours worked out at 14,018, so that the speed obtained on the six runs would be more than maintained throughout the rest of the trials.

The gunnery and torpedo trials were proceeded with on the 30th April, and owing to the fine weather which prevailed these trials, although extensive, were completed in a day. The guns passed through the usual service trial, and one of the 7·5-inch guns and two of the 10-inch guns were also selected for rapid firing at a target. During these trials for rapidity the ammunition was served exactly as it would be served in action, and everything was carried out under the same conditions. The guns were worked by men from the Elswick works, but a trained captain of the turret was lent from the "Excellent" to do the actual shooting. The accuracy of the shooting and the rapidity of the firing were entirely satisfactory. Although several rounds from the 10-inch guns were fired right over the decks fore and aft, no damage was done to the structure or fittings of the vessel in spite of this severe test. The torpedoes were fired from the submerged torpedo-tubes at speeds of 15, 16, and 17½ knots. These are the first trials of the Elswick submerged torpedo-tubes in a British ship. The Admiralty torpedo officers were perfectly satisfied with their performance. It is interesting to recall the results of the trials of the "Triumph," her sister ship, made in the first week of December last, under conditions prescribed by the Chilian Naval Commission, and reported in *The Times* of December 7th. On a six hours' full-power run, with a mean draught of 24 feet 7½ inches, a mean speed of 20·17 knots was obtained, the stipulated H.P. was exceeded, and the coal consumption was no more than 1·73 lbs. per I.H.P. per hour. The result of the trials of the "Swiftsure" thus confirm those of the "Triumph" in a remarkable manner. The two vessels are now to be commissioned, and an opportunity will thus be given for testing them with Admiralty-designed vessels of a similar character.

The new twin-screw shallow-draught gun-boat "Widgeon," which has been built by Messrs. Yarrow & Co. (Limited), of Poplar, to the order of the Admiralty, has made a successful trial. The vessel has been designed especially for operations in shallow water, and is fitted with a device which has been introduced by Messrs. Yarrow & Co. to enable efficiency, in regard to propulsive effort and speed, to be obtained with various conditions of lading. The twin screws are placed in tunnels aft in the manner already adopted in similar craft constructed for the Government by this firm. These tunnels consist of inverted troughs raised in the skin plating of the after part of the hull, the floor of the latter being very flat in order to secure the shallow draught. The crown

of the tunnel is considerably higher than the water level, and as the propeller blades in revolving come within mere clearance distance of the top of the tunnel it will be evident that a considerable part of the propeller is also above the water level. The tunnel, however, dips below the surface all round—that is, its edges are under water. When the screws are caused to revolve they drive the air out of the tunnels, and the water, rising to fill the vacuum thus caused, causes the screws to be fully immersed. For this action to take place it is, of course, necessary that there should not be free access of air to the tunnel. If the lading, and consequent draught of water, were constant, the arrangement would be satisfactory; but as it is necessary to provide for the lightest draught when the vessel is fully loaded, there is considerable retardation owing to the propeller race being thrown against the after slope of the tunnel. In order to overcome this defect, Messrs. Yarrow & Co. have introduced a hinged flap, which forms the back part of the tunnel. At deep draught this is completely raised, and it is lowered as the vessel comes up in the water owing to consumption of fuel and stores or from any other cause. In this way an unobstructed flow to the propeller race is obtained, and yet a vacuum is secured in the tunnel at any draught.

The trials were designed more especially to test the efficiency of the device, and were carried out in the estuary of the Thames. They consisted first of a six hours' run at 11 knots, and a two hours' run at 13 knots. These two runs were made consecutively without a stop, the actual speeds being 11·030 knots and 13·058 knots respectively. The latter speed is remarkable, considering the draught was no more than 2 feet 8 inches. These runs were made with the flap up, the vessel being fully laden. An hour's run was then made with the flap down, the conditions in all other respects being as on the two hours' trial. The speed came out at 12·218 knots. It will therefore be seen that by means of the flap the speed of the vessel on full draught was raised more than four-fifths of a knot over what it would have been under the old conditions.

The "Widgeon" is 160 feet long and 24 feet 6 inches wide, the depth of hull being 6 feet. For facility of transport she has been constructed in sections not exceeding 18 feet in length fore and aft, each section being capable of floating by itself. These sections are so arranged, by means of deep floors or low bulkheads, that they can be bolted together in the water, and the complete vessel thus be built up afloat. The machinery space is protected by chrome steel armour of sufficient thickness to be bullet-proof at a point-blank range of 20 yards. On the upper deck there is an armoured battery 78 feet long, also protected by hard steel armour. Here are mounted two 6-pounder Q.F. guns and four rifle calibre (·303) Maxim machine guns. There is also an armoured conning tower forward.

The engines are of the compound condensing type, and the boilers are the Yarrow straight water-tube description. There are a steam windlass, with special warping arrangements for hauling up rapids, steam steering gear, and other auxiliaries.—*Times*.

AUSTRIA-HUNGARY.—*Naval Estimates for 1904.*—The Ordinary Budget for the current year amounts to 39,439,450 kronen (£1,643,310 8s.), showing an increase of 4,610,510 kronen (£192,104 13s.) over 1903; and the Extraordinary Estimates amount to 10,586,960 kronen (£441,123 7s.), showing a decrease of 3,524,920 kronen

(£146,871 13s.) as compared with last year, making a grand total of 50,026,410 kronen (£2,084,433 15s.) for both Budgets, or an increase of 1,035,590 kronen (£43,149 12s.).

The principal items of the Ordinary Budget are as follows:—

	Kronen.	£ s.
Pay of officers, etc.	4,238,100	= (176,587 10)
Pay of petty officers and seamen, with clothing ...	3,382,920	(140,955 0)
Land service	1,884,830	(78,534 12)
Sea „	4,541,190	(189,212 2)
Establishments:—		
Hydrographical Office and Naval Library	76,130	(3,172 2)
Naval Academy	217,940	(9,080 17)
„ lower-grade schools	5,790	(241 5)
„ hospitals	224,320	(9,346 13)
Maintenance of the Fleet:—		
Dockyards, repairs, and *matériel*	7,312,270	(304,677 18)
New Ships and Machinery:—		
Fifth Vote out of a total Vote of 11,785,050 kronen (£491,043 15s.) for first-class armoured cruiser "St. Georg" of about 7,300 tons displacement ...	2,600,000	(108,333 7)
Fourth Vote out of a total Vote of 17,400,000 kronen (£733,333 7s.) for first-class battle-ship "Erzherzog Karl" of about 10,600 tons displacement	4,200,000	(175,000 0)
Third Vote out of a total Vote of 17,400,000 kronen (£733,333 7s.) for the first-class battle-ship "B" of about 10,600 tons displacement	4,000,000	(166,666 13
First Vote out of a total Vote of 17,400,000 kronen (£733,333 7s.) for the first-class battle-ship "C" of about 10,600 tons displacement, Ersatz "Novara"	2,200,000	(91,666 13)
Ordnance	1,228,000	(51,166 13)
Miscellaneous Expenses	3,572,960	(148,873 15)
Apparent total	39,684,450	(1,653,518 15)
Certain deductions	245,000	(10,208 7)
Real total	39,439,450	(1,643,310 8)

The following are the principal items of the Extraordinary Estimates:—

	Kronen.	£ s.
Expenses connected with Naval Academy, ships' libraries, charts, etc.	18,100	= (754 5)
Maintenance of the Fleet—New Ships and Machinery:—		
Third Vote out of a total Vote of 4,500,000 kronen (£187,500) for a steel floating dock	180,000	(7,500 0)
Sixth and last Vote out of a total Vote of 12,756,430 kronen (£531,517 18s.) for battle-ship "Arpad" of 8,340 tons displacement	185,000	(7,708 7)
Fifth and last Vote out of a total Vote of 12,905,000 kronen (£537,708 7s.) for battle-ship "Babenberg" of 8,340 tons displacement	2,475,480	(103,145 0
Third Vote out of a total Vote of 3,400,000 kronen (£141,666 13s.) for two Danube monitors and five patrol-boats	750,000	(31,250 0)

Ordnance—Guns, Gun-mountings, Ammunition, Torpedoes, Submarine Mines, etc.:—	Kronen.	£ s.
Fourth and last Vote for armament of coast-defence battle-ship "Babenberg"	500,000 =	(20,833 7)
Fourth Vote for Armament of first-class armoured cruiser "St. Georg"	700,000	(29,166 13)
Second Vote for Armament of first-class battle-ship "Erzherzog Karl"	1,300,000	(54,166 13)
First Vote for Armament of first-class battle-ship "B"	800,000	(33,333 7)
First Vote for Armament of the two Danube monitors	400,000	(16,666 13)
Vote for 8-mm. machine guns and revolvers	81,790	(3,407 2)
Votes for ammunition for "Arpad," "Babenberg," "St. Georg," "Erzherzog Karl" and for 15-cm. Q.F. guns	2,160,000	(90,000 0)
Vote for torpedoes and torpedo-nets	180,000	(7,500 0)
Vote for Wireless Telegraphy Apparatus	60,000	(2,500 0)
Workshops, buildings, and other works	641,000	(26,708 7)
Expenses in connection with the detachment in China for guard duties	235,590	(9,816 5)
Total	10,586,960	(441,123 7)

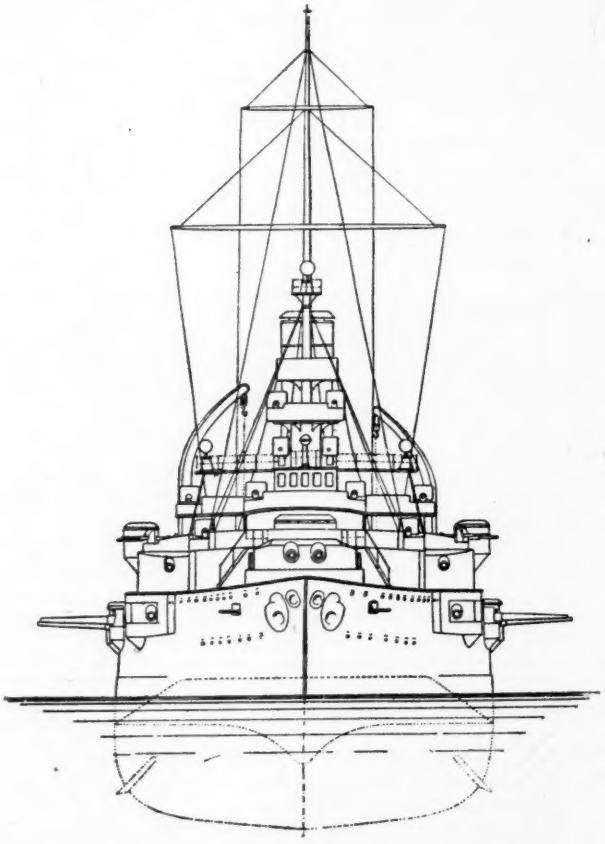
Launches.—The new first-class battle-ship "Erzherzog Friedrich" was launched on the 30th ult. from the yard of the "Stabilimento Tecnico Triestino" at Trieste, where of recent years so many of the battle-ships for the Imperial Navy have been constructed. The launching ceremony was performed by the Arch-Duchess Isabella, daughter of the Arch-Duke and Arch-Duchess Frederick, who, with a distinguished suite, were also present. The "Erzherzog Friedrich" is the second battle-ship of a new type, the first of the class, the "Erzherzog Karl" having been launched from the same yard on the 4th of last October, her first keel-plate having been laid on the 24th July, 1902; and one other of the same class is under construction by the same firm.

The dimensions of these ships are as follows:—Length between perpendiculars, 385 feet 6 inches, over all 404 feet 6 inches; extreme beam at water-line, 72 feet 2 inches; draught 24 feet 7 inches, on a displacement of 10,630 tons. The hull is constructed of Martin-Siemen's mild steel; the double bottom extends for 65 per cent. of the ship's length, and is sub-divided in the usual way into numerous compartments, while the transverse water-tight bulkheads are carried up from the double bottom to the main battery deck. The armour deck, which is 3 inches thick on the slopes, is curved down on the sides to meet the lower shelf of the armour belt, and before and abaft the belt curves down to the bow and stern.

Protection is afforded by an armour belt of chrome-nickel steel 8·2 inches thick, reaching from 4 feet 4 inches below to 3 feet 6 inches above the water-line, and extending 65 per cent. of the ship's length; above this is a second belt 4·7 inches thick, which reaches to the battery deck, covering an extent of side 10 feet deep, while both ends of this casemate are closed by armoured transverse bulkheads, the foremost one 8 inches thick, and the after 4·8 inches. The armour of the belt and bulkheads is secured on a teak backing 4 inches thick. From the foremost end of the belt to the ram the side is protected by 2-inch plating, which is carried down from the main deck to the lower edge of the armour deck.

On the main deck amidships extends an armoured casemate, protected by 6·6-inch armour, with 4·7-inch transverse bulkheads, and 1·5-inch splinter screens between the guns. The barbettes

for the heavy guns are protected with 10-inch armour, with 8·4-inch ammunition tubes, while the hoods for the guns are 8·8-inch. There are two conning towers, the fore one protected by 8·8-inch armour, the after by 5-inch, while the communication tubes from both to below have 6-inch plating, tapering to 3·7-inch. The tubes for the chain cables between decks are also armoured. The nickel-chrome steel armour, and the

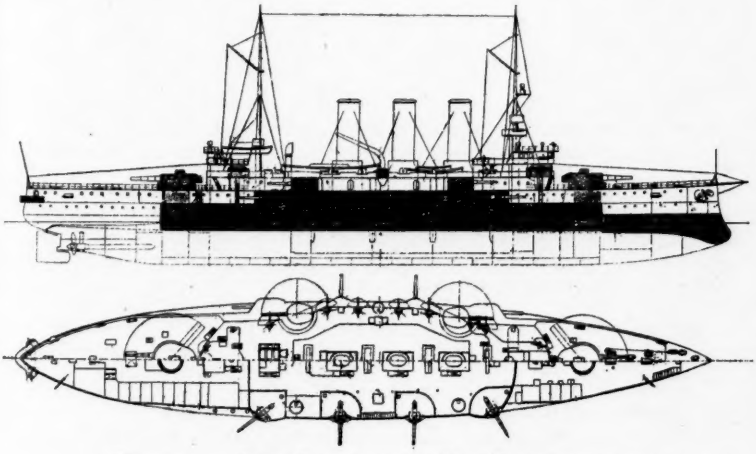


Bow View of the "Erzherzog Karl."

nickel steel is provided by the great Witkowitz firm, who for years past have provided all the armour for the ships of the Austro-Hungarian Navy; the mild steel plates for the hull are provided by the Alpinen Montan Company, at Zeltweg.

The armament consists of four 9·4-inch 40-calibre guns; twelve 7·5-inch Q.F. 42-calibre guns; twelve 9-pounder Q.F. 45-calibre guns; twelve 1-pounder machine-guns, and four mitrailleuses.

The 9·4-inch guns are mounted in pairs in the barbettes, one forward and one aft; the guns being loaded and worked by electricity, or by hand as requisite, while the ammunition hoists are also worked by electricity. The 7·5-inch guns are mounted, eight in the casemate battery, and the remaining four singly in turrets on the upper deck, two on each beam, which are protected by 6-inch armour; the ammunition hoists for all these guns are worked by electricity, while the guns are worked by hand, and should fire four aimed rounds per minute. The 9-pounders and small machine guns are distributed over different parts of the ship as customary. The height of all the guns above the water-line is considerable, so that they can all be fought in an ordinary sea. The 9·4-inch guns are 26 feet above the water; the 7·5-inch guns in the casemate are 14 feet 6 inches, and those in the upper deck turrets



PROFILE AND DECK PLANS OF THE NEW BATTLE-SHIPS OF "ERZHERZOG KARL" CLASS.

23 feet. The guns are so arranged that there can be a bow fire from two 9·4-inch, four 7·5-inch, four 9-pounders, and eight 1-pounder guns; while on the broadside, four 9·4-inch, six 7·5-inch, six 9-pounders, and eight smaller machine guns, can be brought to bear. The 9·4-inch. guns are of a new type and the ships of this class, and the new armoured cruiser "E," at present building, are the first to be supplied with them. All the guns are manufactured by the Skoda firm, at Pilsen.

The engines are to develop 14,000-I.H.P., with 132 revolutions, which is to give a speed of 19·3 knots; steam being supplied by 12 Yarrow water-tube boilers in groups of four in three boiler rooms; both boilers and machinery being constructed by the firm who are building the ship. The total heating surface of the boilers is 3,758³ square metres (40,436·08 square feet), with a grate surface of 76·3² square metres (820·98 square feet). The ships carry two steam and twelve pulling boats.

The new first-class armoured cruiser "St. Georg" was launched on the 8th December, from the Imperial Dockyard at Trieste. Her dimensions are as follows:—Length, 384 feet; beam, 62 feet; displacement, 7,300

tons on a draught of 21 feet 4 inches. The engines are to develop 13,000-I.H.P., giving a speed of 21 knots, steam being supplied by 12 Yarrow water-tube boilers. Protection is afforded by an 8·2-inch Krupp steel belt for about two-thirds the length of the ship, carried up to the main deck, tapering forward to 2 inches, and the lower streak tapering to 5 inches. Amidships on the main deck is a central casemate battery, protected with 6-inch armour, while on the barbettes for the heavy guns the thickness of armour is 8·2-inch. The transverse bulkheads are 7·5-inch and the armoured deck 1·5-inch on the flat and 3·5 inches on the slopes. The armament consists of two 9·4-inch guns, mounted in the fore barbette, with 8-inch hoods; one 7·5-inch Q.F. gun, mounted in the after barbette, and four others of the same calibre in the central battery; four 5·9-inch Q.F. guns on the upper deck with shields, and twenty-five small Q.F. and machine guns. There are two torpedo-tubes, both submerged.

On the 26th March, the small river monitor "Bodrog," for service on the Danube, was launched at Buda Pest. Her dimensions are as follows:—Length, 183 feet; beam, 31 feet; displacement, 440 tons, with a draught of 3 feet 6 inches. Her engines are to develop 1,400-I.H.P., giving a speed of 12 knots, and she has a coal supply of 62 tons. She is protected on her sides and turret by 1·8-inch specially prepared steel plating, and her armament consists of two 4·7-inch Q.F. 35-calibre guns, in turrets, one forward and one aft; a 4·7-inch howitzer; two 12-pounder Q.F. and three machine guns. She will have a crew of 73 officers and men.

The Personnel.—The active list of executive officers, stands as follows:—One Admiral; three Vice-Admirals; ten Rear-Admirals; twenty Battle-ship Captains; thirty Frigate-Captains; thirty-five Corvette-Captains; one hundred and forty Lieutenants, 1st Class; seventy-five Lieutenants, 2nd Class; two hundred and five Midshipmen; and one hundred and seventy-five Cadets. The Medical Staff consists of one Medical Inspector-General; one Deputy-Inspector-General, 1st Class; three Deputy-Inspector-Generals, 2nd Class; six Fleet-Surgeons; fifteen Staff-Surgeons; fifteen Surgeons; and fifteen Assistant-Surgeons. The Engineering Staff consists of four Chief-Engineers; fifteen Engineers, 1st Class; thirty-five Engineers, 2nd Class; forty-five Engineers, 3rd Class.

The Training Squadron.—The training squadron, which was formed in January last, consists of the following ships under the command of Rear-Admiral Kneissler von Maixdorf:—

Battle-ships—"Habsburg" (flag), "Arpad," "Monarch."

Torpedo-Cruisers—"Zenta," "Satellit," and nine first-class torpedo-boats. On the 15th June, the squadron will be strengthened for the manœuvre season by some additional specially commissioned ships.—*Mittheilungen aus dem Gebiete des Seewesens* and *Militär Zeitung*.

FRANCE.—The following are the principal promotions and appointments which have been made: Vice-Admirals—M. E. De Maigret to be President of the Consultative Committee of the Navy; C. A. Gigon to

be Commander-in-Chief of the 5th *Arrondissement-Maritime* (Toulon); J. B. Melchior to be Commander-in-Chief of the 3rd *Arrondissement-Maritime* (Lorient). Rear-Admirals—J. A. Fort for service at Toulon; Z. L. Juhel for service at Brest; P. B. Fortin to be Chief of the Staff at Brest; L. A. Massenet for service at Lorient. Capitaines de Vaisseau—J. F. Clément to "Léon-Gambetta"; P. P. Thibault to "Pothuau"; E. M. Lamson to "Bouvines"; P. P. Lecuve to "Desaix"; E. F. Corrard to "La Bretagne." Capitaines de Frégate—M. G. Laurent to Capitaine de Vaisseau; A. L. Champanhac to "Léger" and *Défense-Mobile* in Algeria; L. J. Simon to "Kersaint"; V. E. Fontorbe to "Cassini"; M. L. Delafon to "Forbin"; L. G. Drouet to "Dunois" V. M. Dourver to "Condor."—*Journal Officiel de la République Française.*

Personal.—Vice-Admiral Gigon took over the duties of Maritime Prefect and Commander-in-Chief at Toulon on the 21st ult., in succession to Vice-Admiral Bienaimé, who, with Rear-Admiral Ravel, Major-General of the Navy also at Toulon, have been superseded by the Minister of Marine. The charge against these two high officers is, that through their indiscretion, official documents were improperly communicated to the press. The two Admirals had the opportunity of an interview with the Minister of Marine in Paris, and in this respect they were better treated than the unfortunate Admiral Maréchal, but it only resulted in their being both relieved of their appointments, and placed on half pay. The documents said to have been divulged without authority are those concerning the trials of the cruiser "Sully," and the insufficiency of men at Toulon for manning new ships, and also those concerning the case of a seaman named Kermorvan, whose sentence and punishment on the finding of a Court of Enquiry, the Minister of Marine thought fit to quash and rescind.

The Editor of the *Figaro* has published the following declaration :—

"I affirm upon my honour that neither Vice-Admiral Bienaimé nor Rear-Admiral Ravel have had anything to do with the revelation of documents published by us. We have had no relations direct or indirect with either officer, and they have not participated in any way in our divulgation. If M. Pelletan persists in punishing them, he will be knowingly committing a most unpardonable iniquity."—GASTON CALMETTE.

Vice-Admiral Bienaimé is the third vice-admiral who has been removed from his command by M. Pelletan during the last two years, the other two being Vice-Admirals de la Bonninnière de Beaumont and Maréchal. Vice-Admiral de Beaumont was Vice-Admiral Bienaime's immediate predecessor at Toulon, and was superseded in July, 1902, his nomination as the next Commander-in-Chief of the Active Mediterranean Fleet having been cancelled at the same time; while Vice-Admiral Maréchal was recalled from China last autumn under circumstances which aroused the greatest indignation against the action of the Minister of Marine among officers of all ranks in the Fleet, an indignation which was not lessened by the studied discourtesy with which the admiral was treated by M. Pelletan when he reported himself on his return to Paris.

Vice-Admiral Bienaimé, who vacated his appointment and left Toulon on the 20th ult., amidst many manifestations of sympathy, has the reputation of being one of the most capable officers in the French Navy, and as Maritime Prefect of Toulon should,

in the ordinary course, have hoisted his flag as Commander-in-Chief of the Mediterranean Fleet, but his claims were ignored by M. Pelletan, and for both the Mediterranean and Northern commands he was passed over last year, and he now shares the fate of his predecessor. Rear-Admiral Ravel is the second Rear-Admiral who has been superseded by M. Pelletan, Rear-Admiral Servan having been recalled from his command in the Atlantic in the summer of 1902. In every one of these five cases, the action of the Minister has been sharply criticised, his personal animus against the distinguished officers he has disgraced having been clearly shown.

The Northern Squadron.—This squadron, which should have completed to its full effectives on the 1st ult., is now being reconstituted as follows :—

First Division.

First-class battle-ships—"Masséna" (flag-ship of Vice-Admiral Caillard, Commander-in-Chief), "Carnot," "Jauréguiberry."

Second Division.

Coast-defence battle-ships—"Bouvines" (flag-ship of Rear-Admiral Leygues), "Amiral-Tréhouart," "Henri IV."

Cruiser Division.

First-class armoured cruisers—"Jeanne d'Arc'" (flag-ship of Rear-Admiral Bugard), "Gloire," "Amiral-Aube."

Third-class cruisers—"Forbin," "Cassini."

Destroyers—"Arquebuse," "Bombarde," "Bélier," "Flamberge," "Catapulte," "Balliste" as soon as her trials are completed.

There seems to be some doubt as to whether the ships have their full complements, as there is no doubt a great difficulty at present in providing the number of men required for the needs of the fleet.

As regards the ships, the first-class battle-ship "Carnot," from the Reserve Division of the Mediterranean, takes the place of the "Formidable," a ship now more or less obsolete; while the first-class cruiser "Guichen" has been relieved by the new armoured first-class cruiser "Amiral Aube," to which ship her crew have been turned over, the new first-class armoured cruiser "Gloire," which has completed her trials, taking the place of her sister ship the "Marseillaise," lately transferred to the Mediterranean. The squadron is now stronger than it has been for many years past.

Movements of Ships. — The new first-class armoured cruiser "Desaix" commissioned at Cherbourg on the 19th April, for service with the Mediterranean Fleet, where she will relieve the armoured cruiser "Pothuau," as flag-ship of Rear-Admiral Antoine, commanding the Cruiser Division; she left Cherbourg on the 25th ult. for Toulon, arriving at that port on the 1st inst.; the "Pothuau" is now to be transferred to the Reserve Division. A sister-ship, the "Kléber," after her trials, now being carried out at Cherbourg, is also to proceed to the Mediterranean, where she will relieve the "Latouche-Tréville," one of the earliest type of armoured cruisers, which is in need of thorough repairs. The "Dupleix," the third ship of the group, now the flag-ship of Rear-Admiral Rivet, commanding

the Atlantic Division, is returning to Cherbourg, as although she has not yet been a year in commission she stands in need of a thorough overhaul. The torpedo depôt-ship "Foudre," carrying the two submarines "Lynx" and "Protet," and four vedette torpedo-boats, left Cherbourg for Saigon on 21st April.

The *Temps* give the radius of action at 10 knots speed of the ships which are to form the Squadron in the Far East, when complete, as follows :—

Armoured cruisers—"Montcalm," 10,300 miles; "d'Entrecasteaux," 8,000 miles.

First-class cruisers.—"Guichen" and "Châteaurenault," 7,500 miles; "Jurien de la Gravière," 9,300 miles.

Second-class cruisers—"Friant" and "Bugeaud," 6,000 miles; "Pascal," 5,500; "Sfax," 5,000; "Catinat," 6,000; and "Infernet," and "d'Etrées," 8,000 miles. These figures are taken from official documents.

The torpedo-boats "Rafale," "Borée," "Bourasque," "Tramontane," "Cyclone," and "Forban," are detailed for the *Défense-Mobile* of Tunis replacing the "Argonaute," "Averne," "Tourmente," and "Turco," which are to be attached to the *Défense-Mobile* of Toulon, and probably need repairs. The "Dauphin" and "Aquilon," which are on passage to Bizerta from Brest, has also received orders to join the *Défense-Mobile* of Toulon.

General.—The Minister of Marine has decided to abolish the Ballooning School at Lagoubran, near Toulon. Although the suppression of the school is not perhaps, a matter of much importance in itself, yet as part of the cheese-paring policy of M. Pelletan, it is not a step looked upon with favour in naval circles. That balloons may do good service in war has been proved at different manœuvres, and the time may well come when the want of trained balloonists will be felt. The staff of the school has been ordered to join the different depôts for general service.

The Minister has further decided to place the wireless telegraph stations, which have been established along the coast, under the administration of the Post and Telegraphs. Since their establishment these stations have been in charge of the Navy, and the staff working them is highly trained and efficient. The transference of these stations from the control of the Navy, now that a workable system has been organised and brought into good working order, is considered to be a retrograde step, and most injurious to the fleet in time of war.

A tank for the experimental trial of the underwater forms of new ship designs is being constructed at Paris, at Grenelle, not far from the Seine. An aggregate of 49,500 francs (£19,800) has been voted for the purpose in the Budgets of 1903-4, and it is hoped that this much-needed experimental basin, possessed by most other naval Powers, will be ready for use in 1906.

Explosion on Board the "Forbin." — A 138-mm. (5·4-inch) cartridge exploded, while some men were engaged in stowing ammunition away in one of the magazines, on board the "Forbin" while on passage from Rochefort to Brest, luckily failing to ignite the other cartridges near, but burning five seamen and causing some structural damage to the ship. The explosion is said to be due to decomposition of the powder under the action of excessive heat, presumably

caused by want of ventilation and proximity to the boilers and stokehold. A curious result followed the explosion, which might have had serious effects. Several seamen, who sleep in the battery deck near the communication tube, leading down to the magazine in question, were found during the night half asphyxiated in their hammocks from the effect of the noxious gases released by the explosion of the cartridge. The ship since her arrival at Brest, has been thoroughly fumigated, the men being sent to sleep on board other ships of the squadron.

A Marine Monster.—The following account of a so-called sea serpent observed off Haïphong by the gun-boat "Décidée" is published in the *Temps* :—

In his official report, the Commander of the "Décidée" states :—"I first observed the back of an animal about 300 metres (328 yards) off the port beam, having the form of a rounded black mass, which I took to be a rock, but on seeing it move I imagined to be an enormous turtle 4 or 5 metres (13 to 16 feet) in diameter. Shortly after I saw this mass lengthen out into the form of a serpent with vertical undulations, apparently having a length of 30 metres (98 feet), and a width of about 4 to 5 metres (13 to 16 feet). Different members of the crew can confirm these details in the most circumstantial manner. The animal appeared a second time 150 metres (164 yards) nearer, and dived under the after part of the ship, when the doctor observed the skin to be black, mottled with yellowish markings, and absolutely smooth; no fins were noticed. The head seemed like that of a turtle, and furnished with scales, and with a width of about 80 centimetres (31 inches), and it spouted jets of vaporised water.—*Le Yacht*, *Le Temps*, and *Le Petit Var*.

The New French Armoured Cruisers. —The *Yacht*, in a recent leading article, discusses the new French armoured cruisers. "Between 1897 and 1900," says the writer, "the French Navy laid down scarcely any vessels but armoured cruisers. We have now twelve of them, which have cost at least 250,000,000 francs (£10,000,000). All have been built on the plans of the Technical Section of the Ministry of Marine; thus, besides being similar in appearance, they possess the same good qualities and the same defects, these last exaggerated in the smaller vessels, and the former more apparent in the larger. The cruisers are of four types, viz. : The 'Jeanne d'Arc,' of 11,200 tons; three of the 'Dupleix' class, of 7,740; three of the 'Amiral Gueydon' class, of 9,517 tons, and five of the 'Gloire' class, of 10,014 tons. At sea all the vessels have given good results; their motion is easy, and they steer well; and these good sea qualities have been obtained with a draught of water on the whole of not more than 24 feet, a feature which adds to their usefulness.

We are unable, unfortunately, to say as much in favour of their fighting qualities. Thirty years ago, M. P. Dislère complained that in France the rôle of artillery was not esteemed so highly as in other countries, and that it was our weak point, and things have not changed for the better since 1874. As compared with ships of similar tonnage of other countries, the cruisers of the 'Dupleix' and 'Gueydon' classes are decidedly under-gunned, as the following table will show :—

——	Dupleix.	Bayan (Russian).	Kaiser Karl VI. (Austrian).	Gueydon.	Tokiwa (Japanese).	Friedrich Karl (German).
Date of Launch ...	1900.	1900.	1898.	1899.	1898.	1902.
Displacement, tons	7,740	7,800	6,250	9,517	9,750	9,050
Guns — Large ...	—	II. 20·3-cm. (8-inch)	II. 24·0-cm. (9·4-inch)	II. 19·4-cm. (7·6-inch)	IV. 20·3 cm. (8-inch)	IV. 21·0-cm. (8·2-inch)
Guns — Medium ...	VIII. 16·4-cm (6·4-inch) IV. 10·0-cm. (3·9-inch)	VIII. 15·2-cm (5·9-inch)	VIII. 15·0-cm (5·8-inch)	VIII. 16·4-cm (6·4-inch) IV. 10·0-cm. (3·9-inch)	XIV. 15·2-cm. (5·9-inch)	X. 15·0-cm. (5·8-inch)
Guns — Small ...	II. 65-mm. (9-pounder) X. 47-mm. (3-pounder) IV. 37-mm. (1·7-pounder)	XX. 76-mm. (14-pounder) VII. 47-mm. (3-pounder)	IV. 77-mm. (14-pounder) XIV. 47-mm. (3-pounder)	II. 65-mm. (9-pounder) XVI. 47-mm. (3-pounder) VI. 37-mm. (1·7-pounder)	XII. 76-mm. (14-pounder) VII. 47-mm. (3-pounder)	XII. 88-mm. (15-pounder) X. 37-mm. (1·7-pounder)

"The relative weakness of the armament of our cruisers shows :—

1. That the weight of our guns for a certain calibre is excessive, so that it is necessary to reduce the number of guns carried.

2. The absence of the 7·5-inch Q.F. gun, which is very marked.

3. The absence of the 12-pounder Q.F. gun, almost universally adopted by other countries.

"Moreover, our projectiles are lighter than those of foreign guns, and although they have a high initial velocity, this only compensates for their lightness when fighting at short ranges.

"The armament of our cruisers is, then, weak, nor in some of the types is it well distributed, while its proper protection leaves much to be desired. The 'Amiral Gueydon' class can only fire ahead or astern with one 7·5-inch, two 6·4-inch, and two 3·9-inch guns. In the 'Dupleix' class an end-on fire can only be maintained with two 6·4-inch and two 3·9-inch guns. The arc of fire of the broadside turrets is restricted, while firing end-on from the turrets on the centre line is not without danger. Of the eight casemates for the 6·4-inch guns of the "Gueydon" class, the armour of six does not extend down and join on to the armour belt, so that a shell bursting below them would certainly put them out of action. This defect is to a certain extent remedied in the 'Gloire' class, where the armour of four of the turrets for the 6·4-inch guns is prolonged down to the belt.

"The protection for the hull may be summed up thus :—For the upper portion none; but every possible precaution has been taken against the danger of capsizing or foundering. There is no central redoubt for the protection of the battery; while the casemates, isolated from one another and far apart, only offer here and there patches of armour protection. At the water-line however, there is an armour belt 6 inches thick in the 'Jeanne d'Arc' and 'Gueydon' classes, increased to 7-8 inches in the ships of the 'Gloire' type, while, further, the buoyancy of the ship, even when injured, is practically secured by means of the armoured decks, cofferdams, and numerous water-tight compartments; as a further measure of protection the side forward as high as the upper deck for a length of some sixty feet is protected by light armour plating 3·3 inches thick. Our armoured cruisers, then, have far more of the characteristics of the cruiser than of the battle-ship, and are not fit to

be put in the fighting line. As lookouts for the fleet, they can only reconnoitre, while for despatch and commerce destroying they are very expensive vessels, and small cruisers of some 3,000 tons displacement, such as are now building in England, Germany, and Russia, would be much cheaper and better fitted for the work.

"Then again, can the speed of our cruisers, to which so much offensive power has been sacrificed, be depended upon? The 'Jeanne d'Arc' was to have a speed of 23 knots, but she has never been able to exceed 21·7 knots; while the vessels of the three other types, intended to steam 21 knots, have only reached that speed with great difficulty, and are unable to maintain it, although their boilers, whether Belleville, Niclausse, or Normand, have always developed an I.H.P. considerably in excess of the contract. Yet the trial runs have been made over different bases, in deep water; the screws have been changed, and other steps taken to secure the speed, but with no avail. There is something worse still even than this, and it is that the ships themselves, with all the material of which they are constructed subjected to the extreme limit of its resisting power, have not been able to stand a heavy strain, with the result that in the turning trials the joints of the after outer plating opened to such an extent as to cause serious leaks in the 'Marseillaise' and 'Amiral Gueydon.' Nor have the engines shown themselves free from defects, for there is scarcely one of these ships where there has not been some serious breakdown of the machinery.

"Not only is the speed of these ships a weak point, but such as it is, it cannot be depended upon. It may be maintained for a time on first leaving harbour, but the moment it becomes necessary to get coal from the reserve bunkers difficulties begin, and in order to maintain a speed of more than 15 knots, more than a third of the crew has to be employed in getting the coal to the fires, and we can never hope to attain a higher speed than 18 knots. This was the speed at which the 22·5-knot U.S. cruiser 'Columbia' crossed the Atlantic on her return to New York in 1897, in regard to which Captain Mahan wrote :—'The bunkers of this ship are subdivided into numerous minute compartments, which may be necessary, perhaps, in a battle-ship, but inconsequent and illogical in a ship where speed is the first requirement.'

"Moreover, the whole internal arrangements of our cruisers are faulty, whether as regards ammunition supply, ventilation, or lighting, etc. In fact all our cruisers built since the 'Bruix' class up to the date of the 1900 programme, are defective in offensive power, their defensive power is too much localised at the water-line, their speed is very uncertain, their internal arrangements complicated and bad, and their scantlings weak.

"Who is to blame? 'The Technical Section of the Ministry of Marine,' say some critics. But this is unjust, because the Technical Section has given the ships good lines, has made them handy and good sea-boats; although it must be held responsible for the awkward arrangements for storing the reserve coal. But the blame for the weak armament, the badly arranged protection, etc., rests with the Gunnery Department, the Superior Council of the Navy, and the Ministers who have insisted on ships with too small displacements, made impracticable alterations in the original plans, and exaggerated the protection at the water-line, etc. Although their motives have been praiseworthy, yet the results have certainly not been fortunate."—*Le Yacht.*

MILITARY NOTES.

PRINCIPAL PROMOTIONS AND APPOINTMENTS, APRIL, 1904.

Lieut.-Generals—Lieut.-General F. W. Lord Grenfell, G.C.B., G.C.M.G., to be a General in the Army.

Major-Generals—Major-General Sir E. G. Barrow, C.B., I.A., to be a First Class District Commander in India. Major-General Sir C. C. Egerton, K.C.B., D.S.O., I.A., to be a Lieut.-General in the Army. Major-General W. H. Mackinnon, C.V.O., C.B., to be Director of Auxiliary Forces at Head Quarters. Major-General E. Leach, C.B., to be Colonel of the Queen's Own (Royal West Kent Regiment).

Colonels—Lieut.-Colonel and Brevet Colonel H. C. Denny, C.B., from h.p., to be Colonel to command the 48th Regimental District (The Northamptonshire Regiment). Colonel (temporary Brigadier-General) A. R. Martin, C.B., I.A., to be Second Class District Commander in India. Colonel C. F. Hadden, C.B., from Commandant Ordnance College, to be Director of Artillery at Head Quarters. Colonel W. E. Franklyn, C.B., Director of Personal Services at Head Quarters, to be a Major-General in the Army. Colonel J. Leach, from a Colonel on the Staff, for Royal Artillery in India, to be a Major-General on the Staff to command the Woolwich District, and temporarily to command the Royal Artillery, IVth Army Corps, and is granted the rank of Major-General in the Army.

BELGIUM.—*Organisation of the Field Army for War.* Many drastic changes have recently taken place in the organisation of the Belgian Field Army for war, since it was notified in the JOURNAL for February, 1903, the most important of which are the following:—The Field Army consists, as hitherto, of 4 infantry divisions altogether, which contain all the staffs and departments of army corps, although the latter have not yet been formed. Each infantry division will be increased by 1 reserve infantry brigade of 2 regiments of 2 battalions each. For this purpose, the reserve battalions, of which there is one to every infantry regiment, will be drawn

on. The 2 remaining reserve battalions of the infantry regiments form the fortress troops, with regard to whose organisation nothing has, hitherto, been made public.

Of the 2 supply columns, which have, up to the present, been attached to every infantry division, only 1 will be retained. The infantry company wagons have also been abolished; on the other hand, 2 ammunition wagons, instead of 1 are provided for every infantry battalion, and the total number of ammunition wagons of the 2 infantry ammunition columns to each division is increased from 41 to 46. Two motors, 1 for passengers and 1 for baggage, are provided for each division, as well as bicycles, for orderly service, to division, brigade, and regimental staffs, and 1 cyclist company, as combatants, per division.

In place of the 2 squadrons of divisional cavalry, each division will have 1 squadron of mounted gendarmes. The total of the regular cavalry remains fixed at 2 cavalry divisions of 2 brigades of 2 regiments, together with 2 horse artillery batteries. The 8 cavalry regiments take the field with all their 5 squadrons. These regiments are split up into 2 half regiments, or groups of 2 or 3 squadrons, which are commanded by a lieut.-colonel or a major.

The Grand Headquarters are divided into 2 groups, of which the first, viz., the chief of the General Staff with 9 General Staff officers, which assists the chief command with regard to operations, whilst the second, consisting of a general with 4 General Staff officers, and the chiefs of the various departments, are responsible for the work on the line of communications under instructions from the chief command. Hitherto, the chief command and its staff has had to carry on the combined work of operations and lines of communication.

The railway company, the bridging transport, together with 1 pontoon company, as well as the field telegraph section, will remain, as hitherto, attached to the Grand Headquarters. The following, in explanation of numbers, will be of interest :—

a. Effective Strength.

Arm.	Units.	Officers.	Men.	Remarks.
Infantry ...	Company	4	260	
„	Cyclist Company ...	4	134	As well as 1 motor for baggage.
„	Battalion	20	1,060	
„	Carabinier Battalion ...	20	935	Including 1 Cyclist Company.
„	Regular Regiment ...	65	3,218	
„	Reserve „ ...	43	2,131	
„	Regular Brigade ...	133	6,445	
„	Reserve „	89	4,271	
Cavalry ...	Div. Squadron	4	101	
„	Field „	5	165	
„	Regiment	36	846	
„	Brigade	75	1,701	
„	Division	150	3,402	
Artillery ...	Field Battery	5	169	
„	Horse „	5	181	
Engineers ...	Field Company	5	250	

b. Infantry Division.—General Summary.

——	Officers.	Rank and File.	Horses.	Wagons.
Staff and Headquarters ...	26	87	86	7
2 Regular Infantry Brigades	266	12,890	364	58
1 Reserve Infantry Brigade	89	4,271	129	21
1 Battalion Carabineers (Chasseurs)	20	935	27	5
1 Squadron Div. Cavalry ...	4	112	115	2
1 Artillery Regiment[1] ...	54	2,332	1,317	156
1 Company of Engineers ...	6	267	31	5
1 Field Telegraph Section...	1	58	18	4
1 Staff Ammunition Column	5	12	16	1
2 Artillery Ammunition Columns	6	224	254	36
2 Infantry do. do.	6	271	350	51
1 Engineer Park	2	80	85	13
1 Medical Column	6	323	77	23
1 Supply Office	2	79	8	2
1 Divisional Transport ...	2	66	99	23
1 Supply Column	2	92	140	32
2 Field Hospitals	13	78	46	10
1 Remount Depôt	3	25	48	1
Total	513	22,202	3,210	450

[1] Of 7 or 8 batteries of 6 guns each. A reorganisation of this branch of the Service will take place after the approaching re-armament, and will, it is expected, furnish 1 artillery brigade of 2 regiments of 6 batteries, each consisting of 4 Q.F. guns, to each infantry division.

c. Total Strength of Field Army :—

2,513 officers, 97,555 non-commissioned officers and men, 21,541 horses, and 2,060 wagons.

Line of Communication Service.—Hitherto there have been no special instructions issued in Belgium for the service of lines of communication. A recently published "Regulations for Service in Rear of the Field Army," however, contains more detailed instructions in this regard, and which lays great stress on the enormous advantages her numerous railways have for Belgium, and gives detailed information about them. Antwerp is selected as the base for drawing provisions, because all depôts and the most important establishments (bakeries, arsenals, etc.) are situated there, and from thence, too, railway lines run in all directions. During the strategic deployment of the Field Army, an assembly station will be established between the latter and the base, on which all transport destined for the Field Army will assemble, and from which all troops will in the first place be taken. When the army moves out of the deployment zone, a nearer convenient railway station will, if necessary, be selected, which will be made into the chief halting station. From thence daily a number of division trains, with the usual daily requirements, will be despatched to each division. These trains will stop at the divisional railway stations in order to hand over their freight to the troops themselves, or to their transport, and will take up any return freight with which they will at once return to the chief halting station. Extra trains will be run for extraordinary requirements. A special train will run daily to those base railway stations which are specially reserved for Artillery, Engineer, Commissariat, and

Medical matériel, will take up there the freight which will always be kept ready laden and return with it to the chief halting station. Finally, collecting trains will also run daily between depôts, and the chief halting station, where all consignments will be formed into divisional trains and despatched to the divisional railway station as soon as the subsidiary halting stations have been telegraphically informed.

These division trains are defined as "mobile magazines," in which all departmental duties will be carried out, and which will carry all the necessary matériel for entraining, and detraining of horses, freight, etc. The trains should, when possible, be all ready at the chief halting station in the forenoon, and reach the divisional railway stations sufficiently early to be able to make over their freight to the divisional transport on the same day. The latter will take this freight to the supply office on the following morning, when they will be issued to the troops. Should the divisional railway station be near enough to the subsidiary halting station, the supply office itself takes over the supplies direct from the railway, and issues them to the troop's wagons. A motor is attached to every division for the more rapid delivery of letters.

A newly appointed section (No. II.) of the Grand Headquarters, is entrusted with the service on the lines of communication, the chief of this section is a general officer, who has under him the heads of the various departments, viz. :—artillery, engineers, commissariat, medical, veterinary, telegraph, and railway (the two latter being civilians). The usual civilian *personnel* is entrusted with repair, destruction and restoration of railways and telegraphs in rear of the army, railway troops, as a rule, only running the railways in the enemy's country. It should also be noted that the Gendarmerie and the Garde Civique are responsible for the safety of the units on the lines of communication.—*Internationale Revue über die gesamten Armeen und Flotten.*

GERMANY.—*Calling out of Reservists and Men of the Landwehr in 1904.*—The general principles regulating the calling out of Reservists and men of the Landwehr for the present year are similar to those of preceding years, and may be summarised as follows :—

1. Prussia and States under the War Department of Berlin.—A third battalion, on a peace footing, will be formed in the Guards' and IXth Army Corps (which will manœuvre before the Emperor) for the regiments consisting of two battalions, viz. : In the 5th Regiment of Foot Guards, in the 5th Grenadier Regiment, and in the 162nd and 163rd Infantry Regiments. A regiment of infantry reserve, as far as possible on a war footing, will be formed in the IInd, IIIrd, IVth, VIIth, XIVth, and XVIIIth Army Corps. A reserve Field Artillery brigade division will be formed in Ist, Vth, VIth, VIIIth, XIth, and XVIIth Army Corps. Finally, the Inspection-General of Foot Artillery will form a Reserve foot artillery battalion. This year's effectives will be very similar to those called up in 1903, viz. :—

162,200	for the	infantry.
3,750	,,	jaegers.
13,900	,,	field artillery.
7,000	,,	foot artillery.
4,200	,,	pioneers.
2,156	,,	railway brigade.
419	,,	balloon sections.
767	,,	telegraph troops.
7,707	,,	transport.

Two-thirds of those called out will be from the Reserve, and one-third from the Landwehr. As a rule the infantry Reservists will be enrolled in existing units; commanders of army corps will lay down the measures to be adopted for the artillery and pioneers; special units will be formed for the transport. These units will be officered, in part, by officers and non-commissioned officers of the Regular Army.

2. Bavaria.—Reserve regiments, battalions, and artillery brigade divisions will not be formed in the Bavarian Army Corps. The total number of Reservists and men of the Landwehr called out will be :—

22,200	for the	infantry.
400	,,	jaegers.
15	,,	machine gun detachments.
2,730	,,	field artillery.
900	,,	foot artillery.
1,100	,,	pioneers, railway battalions, and telegraph company.
50	,,	balloon section.
1,410	,,	transport.

Seven-twelfths of these figures are represented by Reservists.

3. Saxony and Würtemberg.—The dispositions taken in Saxony and Würtemberg are similar to those quoted above, the number called out being almost equal to that which is fixed for the Bavarian Army.—*Revue Militaire des Armées Etrangères.*

GREECE.—*General Command of the Army.*—A law of the 13th December, 1900, which instituted the general command of the Army, confided to the Heir-Apparent, laid down that the Army should be placed under a sole and permanent command, that a foreign officer should be appointed to reorganise the Army, and should have the title of Chief of the Staff of the Command of the Army, and that finally that the Staff of the Army Command should conduct matters which hitherto have come under the administration of the General Staff of the War Department. The application of this law gave rise to certain difficulties which a new law of the 2nd July, 1903, endeavoured to remedy in a certain measure, by relieving the General Commanding the Administration of several auxiliary duties, and placing them in the hands of the War Minister, at the same time more strictly limiting the powers of these authorities.

As a consequence of these changes the arrangements, which at present regulate the General Command of the Army, may be summed up as follows :—

The General Commanding the Army has the rank of a general of division. He is aided by a General Staff having the following composition :—1 colónel, as chief of the General Staff; 1 captain, as aide-de-camp; 1 lieut.-colonel; 1 major; 2 captains; 2 lieutenants; 6 N.C.O.'s as clerks; 4 privates. The General Command has under it the following troops and departments :—The Infantry, the Cavalry, the Artillery, the Engineers, the Hospital Companies, the town of Athens.

The War Department has under it the following corps and departments :—The Gendarmerie, Military Jurisdiction, the Military Prison, Military Penitentiaries, Supervision of War Matériel, Recruiting, General Magazines, Medical Department, Military Instruction, Public Safety, Cartographical Department.

The Army consists of three divisions, each formed into two brigades, and other corps which are decided by Royal decree. Division commanders and special inspectors inspect the corps under their command and report to the General Commanding the Army. Questions which belong more especially to the administration of the General Staff may be also studied by the Staff of the General Command, but the conclusions derived from this study must always be submitted for approval of the War Minister. Promotions and changes of officers have always taken place by Royal decree on the proposal of the War Minister. Nevertheless, as regards officers under the General Command or appointed to pass under the orders of that command, the proposal of the Minister must be backed by that of the General Commanding the Army.

Division and brigade staffs have the following composition :—*Divisional Staff*—1 General Commanding, 1 captain as aide-de-camp, 1 lieut.-colonel as Chief of the Staff, 1 staff captain, 1 surgeon-major, 1 commissary, 2 N.C.O.'s as clerks, 2 privates. *Brigade Staff*—1 brigadier-general, 1 infantry staff captain, 1 N.C.O. as secretary, 2 privates.

The General Commanding may inspect the whole or a portion of the Army under his own authority, and can order the carrying out of inspections by generals of division or special inspectors. A special regulation sanctioned by Royal decree will fix the jurisdiction and authority of the General Commanding the Army and division and brigade commanders; it will decide on the corps, establishments and departments to be under their respective orders, the composition of divisional brigades, their stations and the corps forming them, as well as details regarding the inspection of the Army.—*Revue Militaire.*

NETHERLANDS.—*War Budget for 1904.*—The Budget for the Netherlands Army for 1904 amounts to 26,548,952 florins, an increase of 1,346,496 florins on that of the preceding year. The credits are distributed as follows :—

Chapters.		Florins.
1.	Central Administration (Pay and Allowances)	201,805
2.	Staff *Personnel* (Pay and Allowances) ...	212,480
3.	*Personnel* of Military Administration (Pay and Allowances)	258,175
4.	*Personnel* of Various Arms, etc., of the Landwehr (Pay and Allowances) ...	6,192,325
5.	Commissariat Service	3,049,474
6.	Clothing, Equipment, and Harness	2,743,380
7.	Barrack Department	725,319
8.	Remount and Forage Department	1,563,852
9.	Military Instruction	472,130
10.	Office Expenses	115,610
11.	Various Expenses	474,549
12.	Medical Department	871,076
13.	Military Schools...	399,893
14.	Central Clothing and Equipment Magazines, etc.	368,076
15.	Artillery Service...	1,985,000
16.	Military Topography	73,840
17.	Engineer Service...	774,480

Chapters.		Florins.
18.	Military Transports	173,300
19.	Gratuities and Special Allowances	83,470
20.	Pensions, etc., ...	2,863,750
21.	Gendarmerie	853,145
22.	Unexpected Expenditure	50,000
23.	Extraordinary Expenditure	893,140
24.	Additions to System of Fortification ...	1,145,000
	Total	26,548,952

—*Revue Militaire.*

SPAIN.—*War Budget for 1904.*—The War Budget for the current year amounts to 146,527,252·43 pesetas (or £5,861,090), an increase of 1,186,901·58 pesetas on that of the previous year. The expenses of the War Department are distributed as follows :—

Chapters.			Pesetas.	Cent.
1 and 2.	Central Administration	*Personnel*...	2,561,529	00
		Matériel ...	341,600	00
3 and 4	Provincial Administration	*Personnel*...	11,361,048	00
		Matériel ...	362,072	00
5.	Permanent Corps, Recruiting, etc.		82,335,972	20
6.	Penitentiary Establishments ...		130,177	60
7.	Administrative Services		21,458,427	00
8.	Military Transports		1,679,000	00
9.	Training and Remount		3,496,687	00
10.	Artillery *Matériel*		5,600,000	00
11.	Engineer *Matériel*		4,827,938	80
12.	Sundry and Unexpected Expenditure		360,000	00
13.	Payment for Decorations		328,976	00
14.	Engagement and Re-engagement Bounties		1,650,000	00
15.	Hire of Military Buildings		307,424	83
16.	*Matériel* for Various Corps		400,000	00
17.	Field and Subaltern Officers in Anticipated Retirement		9,326,400	00
	Total		146,527,252	43

The Budget for 1904 differs in but a few unimportant details from that of 1903, and these may be summarised as follows :—

Promotion of all 2nd Lieutenants having more than 3 years' service in that rank; increase of pay for the *personnel* serving in the Canaries and for officers having more than 10 years' service in this rank; creation of an Army Central School of Musketry; creation of a brigade division of 3 mountain batteries for the camp at Gibraltar; organisation of the Field Artillery into regiments of 5 batteries each, distributed into 2 brigade divisions; increase of the Siege Artillery Regiment. The permanent effectives will this year amount to 83,000 men.

As a consequence of the Spanish-American War, an unfortunate plethora of officers has been produced, which paralyses promotion, and absorbs valuable resources. Thus, in Chapter 5 of the Budget, 4,015,558 pesetas is devoted to general officers without employment, on the retired

list or on the cadre of the Reserve, and 8,055,690 pesetas to officers on the retired list or in excess of establishment; in Chapter 17 the sum of 9,326,400 pesetas is given to officers in a position of anticipated retirement. The total represents 21,397,648 pesetas.

Adoption of Conscription by the Chamber of Deputies. — The *Ejercito Español* announces that the Spanish Chamber has adopted the scheme for personal service, advocated in 1903 by General Linares, the War Minister. Several attempts have been made in Spain with a view to introducing this reform, but it required the crisis produced by the last campaigns in the Antilles and the Philippines to arouse the necessary interest in the question, and to cause it to be taken into serious consideration. Thus in 1898 the abolition of substitutes was voted unanimously; at the same time Parliamentary partisanship rendered nugatory all the various schemes prepared by each of the two parties who alternately came into power. General Linares' scheme, which the Chamber has just voted, contains the following principal provisions:—

a. The duration of obligatory military service is increased from 12 to 15 years, 3 of which are passed in the Regular Army, 4 in the 1st Reserve (that of the Regular Army), 6 in the 2nd Reserve, and 2 in the Territorial Reserve. The Minister of War has, however, the power of dismissing the classes on unlimited furlough at the end of 2 years' service, and young men holding certain certificates may be sent to their homes after 1 year's service with the colours. Recruits desirous of feeding and equipping themselves at their own cost are enrolled in a regiment in the neighbourhood of their homes, and are permitted to live outside barracks. Should they come up with a horse, which they undertake to keep at their own expense, they are drafted into a cavalry regiment. Such of them who pay into the Treasury during the period of service imposed on the men of their own class, an annual tax equal to five times the amount of their personal cost, with a minimum of £6, need only do six months' actual service each year during the period of service carried out by other men of their class. This six months is divided into two periods of three months each, one of which is carried out in the spring and the other in the autumn.

b. Exemption on payment, substitution, exemption for smallness of stature, as well as total exemption of service for members of certain religious orders, and for workmen at the Almaden Mines, has been done away with.

c. Adjournments, renewable during three consecutive years, are given for the purpose of study, or for commercial, industrial, and agricultural reasons. At the same time, the number of adjournments may never exceed 10 per cent. of the number of recruits inscribed on the rolls as fit for service.

d. A military tax is imposed on all who, for various reasons, benefit from an exemption of military service. The annual amount of the tax is fixed at five times the amount of the personal cost of the man in question. The duration of payment is for three years (the legal term of service in the Regular Army) for those who are exempted or put back on account of constitutional weakness, and for seven years (the period of service in the Regular Army and the 1st Reserve) for the parents of deserters; men in excess of the contingent are taxed during the period of service that the men of their class are called out for. Indigent persons, as well as men on the lists, who have already two brothers serving, and whose parents have an annual income of less than £60. Those put back for study or for special occupations have, during the period of adjournment, to pay an annual tax, the amount of which is fixed at fifteen times the amount of

their personal cost, the maximum amount being £40. The amount realised by the tax is credited to the War Budget.

Changes in the Organisation of the Army.—The financial law for 1904 provides for the following changes in the organisation of the Army, viz. :—

a. The composition of the 56 home infantry regiments, which had been temporarily fixed at 1 active battalion and 1 battalion cadre, has been increased to 2 active battalions.

b. In the same way cavalry regiments will resume their former composition of 4 active squadrons, instead of that of 3 active squadrons and 1 squadron cadre.

c. The brigade division of mountain guns for the Gibraltar camp, the raising of which was postponed, now consists of 3 batteries, 1 of which is detached to Ceuta. The second brigade divisions of field artillery regiments will consist of 1 battery at the normal and 1 at the reduced effective, instead of 2 batteries at the reduced effective. The first brigade divisions will remain composed of 3 batteries at the normal effective. The number of batteries of the Siege Artillery Regiment is increased from 4 to 5, viz. : 1 battery of 4 steel 15-cm. guns, 1 battery of 4 bronze 15-cm. guns, 1 battery of 4 bronze 12-cm. guns, 1 battery of 4 bronze 15-cm. howitzers, and 1 battery of 4 bronze 15-cm. mortars.

d. The Central Artillery Gunnery School, which is divided at present into two sections, one for field, fortress, and siege artillery, and the other for coast artillery, becomes the Army Central School for Shooting, consisting of 4 sections, the two new ones being for the infantry and cavalry respectively. The organisation of this instructional establishment is the subject of a special regulation.

Organisation of the Army Central School for Shooting. — According to the Regulations, which have just appeared, the objects of the Army Central School for Shooting are the study, practice, and teaching of shooting in the artillery, infantry, and cavalry, and to examine on all matters connected with it. The school, then, is divided into four sections : The 1st, at Madrid, for field, fortress, and siege artillery; the 2nd, at Cadiz, for coast artillery; the 3rd and 4th, at Madrid, for infantry and cavalry. The school is commanded by a major-general, with a permanent *personnel* of thirteen officers. The sections, each under a colonel, who has under his orders a lieut.-colonel, one or two majors, two to six captains, three to five first lieutenants, with a certain proportion of the rank and file, employés, and workmen. The non-permanent *personnel* of the school consists : 1st, of field and subaltern officers of the four branches of the Service and of the Staff Corps, for the purpose of following the various courses, conformably with special instructions issued annually with regard to them ; 2nd, of units of the different branches of the Service. As a general rule, the purpose of the sections, each for its own branch of the Service, is the development and dissemination of all knowledge relative to the practice of gunnery and musketry, as well as to amalgamate the methods of instruction in these branches of military education. All details regarding instruction, studies, and experiments are carefully gone into by the officers of the permanent cadre of the section in question under the presidency of the colonel director. At the conclusion of each course, this technical committee draw up a memorandum, which briefly describes the exercises carried out, as well as the results derived from them; special remarks are subsequently added to this report.

1st Section.

In addition to the teaching of its own special sphere of gunnery, this section is also entrusted with : (*a*) The inspection of powder and ammunition for guns and small arms in existing establishments and parks; (*b*) the examination of regimental reports and those of fortified places on target practices; (*c*) propositions for the drawing up of shooting regulations; (*d*) the study and trial of materials for aiming and for target practice, such as telemeters, chronographs, etc.; (*e* propositions for the acquisition and appropriation of artillery ranges; (*f*) the study of and proposals for fire tactics for guns and for special artillery machine guns; (*g*) the carrying out of all other studies and experiments they may be called upon to perform.

This section organises two annual courses of instruction : one for field, and the other for fortress and siege artillery.

2nd Section.

This section has similar duties to the 1st Section with regard to coast artillery. It must, in addition, initiate proposals with a view to placing the artillery service in maritime places at the height of naval tactical progress. The section organises an annual course which consists of two parts, the first being held at Cadiz, and the second in one of the chief maritime places, selected in turn.

3rd and 4th Sections.

These sections act, as regards infantry and cavalry, in the dual *rôle* of *instruction establishments* and of *technical and experimental committees.* As an instruction establishment, the 3rd Section organises annually :

(*a*). A supplementary course, which lasts for nine months, meant for second lieutenants from the Infantry Academy at Toledo, who have one year's service. The general programme of this course is divided into two parts :—*1st. Study of various sorts of Fire.*—Collective fires, dispersion of bullets, vulnerability of formations, fire problems on the battle-field, ranging, fire supervision; ballistical study of the Spanish Mauser rifle, of the machine gun and of their ammunition, taking to pieces and putting together, inspection of arms and their ammunition; study of the methods of musketry instruction; practical exercises and various experiments. *2nd. Supplementary Technical Instruction.*—Ideas on the method of action by cavalry and artillery fire; tactical problems on the map and war game; theoretical and practical study of field fortifications as well as formations of the ground; destruction and crossing of obstacles; military reconnaissance; cadre exercises and manœuvres with live and blank cartridges.

(*b*). One or more special courses, lasting for two months, for captains and first lieutenants of that branch of the Service. They deal with the following subjects, viz. : Foreign grand manœuvres; tactical methods of instruction, and of infantry fire in Spain and abroad; fire problems on the battle-field; rules for the supervision of fire; analysis and discussion of various exercises carried out at the school; experiments on individual and collective firing; map reading, war game, and exercises on the ground with a view to troop leading under fire; the selection and establishment of ranges; foreign rifles; infantry methods of action.

(*c*). An intelligence course of some days for the purpose of initiating field officers of that arm to the work, experiments, and conclusions of the section.

(*d*). Extraordinary practical exercises, in which a specially selected *personnel* takes part. For purposes of instruction, the 4th Section organises annually: (*a*) A supplementary course, lasting for six months, for second lieutenants from the Cavalry Academy at Valladolid, who have six months' service; (*b*) one or more special courses, lasting for two months, for captains and first lieutenants of that arm; (*c*) an intelligence course for field officers of that arm; (*d*) extraordinary practical exercises in which a specially selected *personnel* takes part. The programme of these courses is similar to the corresponding courses of the 3rd Section.

As technical and experimental committees, the 3rd and 4th Sections are entrusted with: The determination of the conditions to be fulfilled by the armament of infantry and cavalry, as much from a ballistic as a tactical point of view; study of the shooting capacity of small arms and machine guns; study of the methods of musketry instruction and of musketry regulations; investigations and trials of material for target practice, such as telemeters, aiming trestles, etc.; proposals for the acquisition and appropriation of rifle ranges; the examination of annual musketry reports, transmitted by infantry and cavalry corps; experiments with foreign small arms and machine guns; experiments and studies ordered by the higher authorities.

Rewards.—Second lieutenants who, at the end of the supplementary course, are noted as "very good" and "good," are given, the former the benefit of two months', and the latter of one month's leave. Officers who have especially distinguished themselves during the course may be recommended by the War Department for a special reward, such as mention in State documents, a decoration, etc. Captains and first lieutenants should, two months after their return to their garrisons, send to the head of the section a detailed memorandum of the works in which they have participated. Rewards are bestowed on the authors of especially noteworthy memorandums, such as: 1st, missions abroad; 2nd, visit to factories; 3rd, gifts of telemeters, field glasses, etc. Field officers note in a single memorandum, on the conclusion of the course in which they have taken part, their general impressions and make such observations as they may consider profitable for school instruction.—*Bulletin de la Presse et de la Bibliographie Militaires* and *Revue Militaire*.

WAR NOTES.

The fog of war which has hitherto enveloped the Japanese land operations has at last rolled away to a very great extent, and official reports from both Japanese and Russian sources give detailed accounts of heavy fighting, which has been taking place recently on the Yalu. The Japanese, under General Kuroki, began their attack of the Russian positions on the right bank of the river on the 26th April. On the 28th they established themselves on the Russian side of the Yalu, and having in the course of the two following days constructed two pontoon bridges, the Japanese Army crossed during the 30th April, and a general attack commenced at dawn on Sunday, the 1st May. The action opened with a heavy cannonade, by which the Russian artillery were completely silenced. The 2nd and 12th

Divisions and the Japanese Imperial Guards then advanced by three roads, driving the Russians before them. By the evening, the line from Antung to Liushukou was captured by the Japanese, whose Imperial Guard surrounded the Russians on three sides, and after severe fighting captured 28 guns, about 30 officers, and 300 men. The Japanese Reserve Corps advanced to the Liau-yang road. The Russian force appears to have consisted of the whole of the 3rd Division, two regiments of the 6th Infantry Division, with sharpshooters, a cavalry brigade, about 40 guns, and 8 machine guns. The losses on both sides appear to have been very great. According to reliable accounts, the Russian losses in killed, wounded, and captured, could not have been less than 3,000, as one regiment (the 11th) was almost entirely annihilated, losing 2,000 men. The Japanese casualties amounted to about 900. The Russian defeat seems to have been complete, and they were pursued towards Feng-hwang-cheng, large quantities of rifles and ammunition, in addition to the guns, falling into the hands of the Japanese. General Kuroki followed up his victory on the Yalu by the occupation of Feng-hwáng-cheng on the 6th May. The place was occupied without resistance; but before evacuating it the Russians burnt a quantity of ammunition, leaving, however, large quantities of hospital stores behind.

Admiral Hosoya reported the successful landing of a Japanese force on the Liau-tung Peninsula on the 5th May. This landing appears to have taken place at Pi-tsze-wo, on the east coast opposite the Elliot Islands. The troops consisted of the 2nd Japanese Army, and the disembarkation was carried out with but little opposition, and under the fire of the Japanese war-ships. A detachment of these troops occupied Pu-lau-tien, destroyed the railway, and cut off all telegraphic communications with Port Arthur, which is reported to contain a garrison of 23,000, and to be provisioned for a year. The railway at Port Adams is also reported to have been destroyed.

According to recent reports, the Russians are beginning to leave Niuchwang, and are dismantling the forts there.

Only one naval incident of importance has occurred to record during the last month, viz., the third attempt to block Port Arthur, made by Admiral Togo, on the morning of the 3rd May, and which appears to have been attended by a considerable measure of success. Eight steamers averaging a tonnage of 17,313 gross, were employed; their crews numbered 159 officers and men, of whom 15 officers and 90 men were killed or drowned, as it was blowing hard at the time with a nasty sea running, so the attending torpedo-boats were unable to save anyone from four of the steamers.

According to Admiral Togo's report, the eight steamers made boldly for the harbour's mouth, in face of a heavy fire from the forts, and the explosion of many observation mines, one of which sunk the "Aikoku Maru," some five cables before she reached the narrow part of the channel. The channel itself was not only illuminated by the powerful search-lights on shore, but also by large fires, which the garrison had burning at the entrance. In spite of these obstacles, five of the steamers reached the harbour's mouth, breaking the booms, and were sunk in the fairway, two in such positions as to effectually block it for the passage of battleships or cruisers. Besides the "Aikoku Maru," two other steamers were sunk, either by the fire of the forts or by the explosion of mines before reaching the channel. The blockading steamers, which were sunk, were laden with stones and cement, forming a solid mass, which will render the work of clearing the channel a long and difficult piece of work.

The accompanying map has been compiled as carefully as possible, but

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SKETCH MAP OF SOUTH MANCHURIA.

120 121 122 123

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Cheng-chia
Ta-min-tun
Ta-wa
Po-li-tun
Kang-ping
CHANG-TU
Ku-lieh
Chien-chu
Ku-chia-fang-cho
Fa-ku-men
Ta-miao
She-shan-tzu
Ying-pan
Chang-wu-tai-men
Ta-kung-cho
Ha-la-ta-kai
Hsin-li-tun
Shu-chia-kang
San-mien-kuan
Sung-chu
Pao-chia-k
Yi-lu
Liao R.
Chao-pu-ying-ku-tzu
Lu-chia-tun
Pai-tu-chang-mên
Ku-liu-ho-cheng
Hsin-tai-
Hsin-min-tung
Pan-la-mên
Ta-pei-chi-pu
Lao-pien
Pu-hô
Ching-ho-mên
Erh-tao-ching
Ha-san-chia-tzu
MUKDEN
La-la-tun
Tung-nan-kou
Hsiao-hei-shan
Hun-hô-pu
Su-ya-tun
Shao-hu-yung-tzu
Kuang-ming
Chang-shing
Chiang-ho-men
Erh-tai-tzu
She-ho-pu
Railway
Shih-li-hô
Yi-chou
Chang-sin-tien
Kao-pan-tzu
Fa-chia-chuang
Yen-tai
Yen-tai
Tu-cheng-tzu
Li-yang-yu
Pan-shan
Wu-zi-tai-tzu
Chang-hen
Pen-si-hu
Sung-tsui-ling-mên
Heing-lang-tien
Shi-san-tan
Kao-ping-chen
Chiu-tai-yuan-tzu
Hsiao-pan-chuan
Tang-chin-cheng
Liao-yang
Ta-ling-ho
Ka-chia-tzu
Shou-shan
CHIN-CHOU-FU
Hsiao-ling-hô
Hsiao-pei-hô
Nan-tao coal mines
Shuang-tai-tzu
Sha-ho-pu
Lang-tzu-s
An-shan-chan
Sin-tai-mên
Kao-chiao
Tien-chiao-chang
Tien-chuang-tai
Niu-chuang
Hai-cheng
Tu-hô-pu
Li-shu-kou-mên
Pai-shi-tsui-mên
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NEW-CHUANG
Suan-chin-tzu
Ta-shih-ch-iao
Pan-chia-tai
Ha-chia-pu
Sha-tau
Ming-shu-tang-mên
San-li-chia
Chung-hou-so
Yi-chia-feng
Chien-wei
Chien-so
Liaotung Gulf
Pô-lu-pu
Tao-chia-tien
Kai-ping or Kai-chou
Sin-yen
San-
Hsiung-yao
HSIU-YEN-CHOU
Wa-fang-
Shan-hai-kuan
(From Peking 170 miles (approx.)
Syun-i-chen
Wan-chieng-ling
Liao-chia-kou
Wa-fang-kou
Yang-ti-hei
Ta-chuang-ho
Fu-chou
Hui-tu-ho
Sha-pao-tau
Wa-fang-tien
Chang-ching-tao
Shai-kin-tzu
Wan-chia-tun
Pu-lian-tien
Chin-chang
Betsivo
Society B.
Elliot Group
KOREAN
San-chia-tu
Kin-chau B.
Chin-chou
Ta-chan-shan-tao
Kuan-lu-tau
Terminal Pt.
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Port Arthur
Lao-thie Shan Chanl.

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125 (From Harbin 75 miles approx.)
126
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Ta-la-chi-tao
Ta-chuan-tien
Hsin-tien
Hsin-lun-tien
Chuan-sian-pu
Ya-mang
Ta-shun-li-tun
Ta-ta-he-tzu
Wu-hai
Nung-an-cheng (Lung-wan)
Hsiao-pa-chia-tzu
Lai-sha-tzu
CHANG-CHUN-FU
Shaang-cha-hâ
Kuan-chan
K'sin-chan
Huai tê hsien
Hsin-nan-pu
Fan-chia-tun
Tung-liao-ho
Chiao-yang-pu
Kun-dulan (Kung-chu-ling)
Yu-shu-chai
Kai-fu-chai
Cheng-chia-tun
San-ke-shu
Ko-chia-tien
Wan-fa-hai
Wan-lin-hô
Ssu-ping-kai
Ta-min-tun
Feng-hua
Ta-wa
Pan-lo-shan-min
Shuang-miao-tzu
Yi-ho
YI-TUNG-CHOU
Pin-tao
Po-li-tun
CHANG-TU-FU
Kai-yuan
Kei-yüan-pu-men
Sin-chia-tai
Sha-hô
Shan-ma-pu
Tieh-ling
Fan-ho
Sung-chia-pao
Pao-chia-kang
Yi-lu
Hsin-tai-tzu
Pu-hô
MUKDEN or Feng-tien-fu
Su-ya-tun
Yen-tai
Wu-lô-po
Pan-si-hu
Ta-ling-shui-ho
Lang-tzu-shan
Mo-tien-ling
Tsao-ho-kou
Pan-chia-tai
Sha-tau-kang
Feng-huang-cheng
San-lu-chai
Wa-fang-tien
Chiu-lien-cheng
Ta-ku-shan
An-tung
Ta-hung-mou
Sha-kan-tzu
Wi-ju
Yong-am-pho
To Seoul
Chol-san
Hsu-ran-got
Ko-song
An-ju
KOREAN Bay
Tsuan-yang-lai
Huang-ti-li-tai
Chu-yu-pu
Fu-chia-tung
Chan-tien
Ta-ku-cha-tzu
Chao-yung-shan
Chien-chan-kou
Ying-yi-cheng
Chang-tien-tzu
Tung-hua-hsien
Huan-jen-hsien
Teng-tzu-ku
Ta-kiang
Yalu River
Chhang-song
Ryok-Dong
Phyongan Do
Chi-an
Ta-tsu-shu
Ta-tien
Chosan
Po-shui-hô
Kuan-dien
Un-san
Yu-gok
Ko-yon-hsu
Kang-kyei
Hang-kang-ko
Yi-la-chi
Cha-li-hô
I-ma-ho
Wu-ta-hô
Shuang-yang-tzu
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Yo-mu-kou
Chan-li-tao-pu
Hsaio-tien-ping
Hei-fa-ho-kou-tzu
Kuan-Kai
Sian-tzu-la-kou
Hei-shih-tou
Wang-pa-tai-tzu
Li-shih-kau
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San-chui-ho
Yu-tai-yin
Tan-ho-kou
Hsino-sha-erh
Man-cha-ya
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Cha-sang
Hu-chhen
Yalu River
HAM-HEUNG
Chyung
YON-BYON
Nap-chon
Pak-chon
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TOK-WON
U-dal
Hseun-san
Ping-yang
U-chun-hua
SAM-HUA
Ping-yang inlet
Yalu
Phyongan Do

Ta-la-chi'iao
Ya-miang
Ta-shih-li-tun
Ta-ta-he-tzu
Lian-chia-tzu
San-yan-tun
Wa-hai
Mai-sha-tzu
CHANG-CHUN-FU
Hsi-chan-chuan
Chan-tsui-tzu
Shi-tou-tien
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Kuan-chan
CHAN-KU
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HIRIN
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Ta-fan-chan
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Tian-tao-yo
Lan-kou-tui
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River
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Chosan
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Tan-chong
Sieng
Po-shui-hô
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Hpyong-hpo
I-won
Yallada Bay
Byok-Dong
Un-san
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Hon-won
Chhang-song
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HAM-HEUNG
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YON-BYON
Nap-chon
Pak-chon
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An-JU
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Korean Gulf
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Grodekova
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Popovka
Chiornigovka
Petropavlovka
Lialichi
Lazarevo
Ustrechnaya
Utesnaya
Pavlovka
Romanovskaya
Anuchino
Gholenki
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Nicolskoie
Pachilovka
Krounovka
Baranovski
Rasdolnoie
Khan-Chka-dadi
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Sha-lo-hen
Lake-Pei-ho
Lake-Nan-ho
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Wan-sin
R. Tuman
Hoa-ryong
Kyong-heung
C. Linden
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San-su-chon
C. Kosakow
SEA OF JAPAN
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So-buk
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REFERENCES.

Railways marked thus ═══
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Approximate Scale: 30 Miles to One Inch

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in view of the conflicting nature of the nomenclature and position of different places, and of all but the principal features of the coast and country, its accuracy cannot be vouched for.

NAVAL AND MILITARY CALENDAR.

APRIL, 1904.

4th	(M.)	Japanese scouts entered Wiju.
"	"	General Younghusband, with the flying column, entered Guru in Thibet.
5th	(T.)	H.M.S. "Diana" arrived at Plymouth from Mediterranean.
"	"	H.M.S. "Lancaster" commissioned at Chatham for Mediterranean.
6th	(W.)	H.M.S. "Russell" paid off at Devonport.
"	"	2nd Bn. Royal Munster Fusiliers left Ireland for Gibraltar in the "Dunera."
"	"	News received that the Japanese had destroyed the Russian depôt at Yongampho.
7th	(Th.)	H.M.S. "Queen" commissioned at Devonport for Mediterranean.
"	"	H.M.S. "Russell" commissioned at Devonport for Home Fleet.
"	"	Japanese troops landed on the Yalu.
8th	(F.)	Agreement was signed between Great Britain and France.
"	"	3rd Bn. Royal Warwickshire Regiment arrived at Gibraltar from Bermuda in the "Dilwara."
10th	(S.)	2nd Bn. Royal Munster Fusiliers arrived at Gibraltar from Ireland in the "Dunera."
11th	(M.)	The British Mission occupied Gyangtse, Thibet, without any loss.
"	"	2nd Bn. Loyal North Lancashire Regiment left Gibraltar for South Africa in the "Dilwara."
"	"	2nd Bn. Royal Garrison Regiment left Gibraltar for South Africa in the "Dunera."
13th	(W.)	H.M.S. "Cadmus" commissioned at Sheerness for Australia.
"	"	1st Bn. Rifle Brigade left England for Malta in the "Plassy."
14th	(Th.)	H.M.S. "Blanche" arrived at Plymouth from South Atlantic Station.
"	"	H.M.S. "Iphigenia" commissioned at Portsmouth for China.
"	"	Near Gyangtse, Thibet, General Macdonald, who was opposed by 2,000 of the enemy, executed a flank movement and put them to flight. British casualties 3, enemy's casualties 200.
16th	(Sat.)	H.M.S. "Queen" left Plymouth for the Mediterranean.
17th	(S.)	H.M.S. "Intrepid" arrived at Plymouth.
"	"	2nd Bn. Cameron Highlanders left Malta for South Africa in the "Soudan."
18th	(M.)	Submarine "A 1" successfully raised at Spithead.
19th	(T.)	Launch of the scout "Sentinel" from Messrs. Vickers Yard, at Barrow.
20th	(W.)	H.M.S. "Endymion" commissioned at Chatham for Channel Fleet.
"	"	2nd Bn. Essex Regiment left England for Malta in the "Sicilia."
21st	(Th.)	Martial law was proclaimed at Newchwang and Yingkow.
"	"	Illig, in Somaliland, was stormed and taken by a mixed force of bluejackets and men of the 1st Bn. Hampshire Regiment British loss, 3 killed and 6 wounded.

22nd (F.) H.M.S. "Cadmus" left the Nore for Australia.
24th (S.) H.M.S. "Amphion" arrived at Plymouth from Pacific.
26th (T.) 2nd Bn. Loyal North Lancashire Regiment arrived in South Africa from Gibraltar in the "Dilwara."
27th (W.) H.M.S. "Iphigenia" left Portsmouth for China.
" " 2nd Bn. Royal Garrison Regiment arrived in South Africa from Gibraltar in the "Dunera."
" " 2nd Bn. Cameron Highlanders arrived in South Africa from Malta in the "Soudan."
28th (Th.) Launch of first-class armoured cruiser "California" from the Yard of Union Ironworks, San Francisco, for United States Navy.
" " 2nd Bn. Essex Regiment arrived at Malta from England in the "Sicilia."
29th (F.) 1st Bn. Royal Garrison Regiment left Malta for South Africa in the "Sicilia."
30th (Sat.) Launch of first-class armoured cruiser "Devonshire" at Chatham.
" " Launch of first-class battle-ship "Erzherzog Friedrich" from the Yard of the "Stabilimento Tecnico Triestino," Trieste, for Austro-Hungarian Navy.
" " Launch of first-class battle-ship "Démocratie" at Brest, for French Navy.
" " Launch of third-class cruiser "München" at Bremen for German Navy.
" " 2nd Bn. West Yorkshire Regiment left Durban, South Africa, for England in the "Dunera."
" " News received of fighting in Southern Nigeria by Major Trenchard's column. British casualties 11, enemy's 200.

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Kriegsgeschichtliche Einzelheiten (*Episodes of Military History*). *Herausgegeben vom Grossen Generalstabe* (*Kriegsgeschichtliche Abteilung 1*). Vols. 32-33. *Erfahrungen aussereuropäischer Kriege neuster Zeit. Aus den südafrikanischen Kriege 1899 bis 1902.* Colenso, Magersfontein, Bloemfontein. (Berlin: Mittler and Sohn, 1903-4.)

The War in South Africa. Prepared in the Historical Section of the Great General Staff, Berlin. Authorised translation by Colonel W. H. WATERS, R.A., C.V.O. (London: John Murray. 1904.)

This admirable *précis* of the earlier phases of the war in South Africa has been compiled from various sources with their usual thoroughness and care by the German General Staff, who, however, preface their account by the remark that only certain periods especially instructive in a military sense are sketched in the form of studies for the benefit of German officers. It is, however, so concise, so clear, and on the whole so correct and impartial an account that all British officers would equally benefit by its study. The method followed is to give a brief but sufficiently complete narrative of the events, leaving out all collateral matter, and to comment upon the strategical and tactical action at the end of each chapter. Occasional marginal notes make the text easy to follow, and all necessary additions, such as tables of strengths, orders of battle, etc., are put at the end. The maps given in the pocket at the end of the book are clear and

well drawn. Like most German military books, however, it is without an index, which is a great defect, and the very limited table of contents at the head of each volume scarcely makes up for it.

In a terse and well-written introduction the authors give a brief account of the immediate cause of the war and the mobilisation of the British forces in 1899. This is followed by an excellent description of the theatre of war, in which the enormous extent of the country to be covered by the operating armies is well shown. A map showing the disposition of the British forces at the outset, and with another on the same sheet to the same scale, showing the area of country between Leipzig, Berlin, and Hamburg, is given for purposes of comparison. This is the method followed in German schools, which much facilitates the comprehension of maps of foreign countries. A brief narrative of the events of the Boer outbreak and of General Colley's disaster in 1881, which, though not very clear, is sufficient for the purpose. Sir E. Wood is not mentioned in it. Sir George Colley is said to have determined on his *coup* at Majuba because his successor, General Roberts, was coming to relieve him. The account of Majuba is apparently taken entirely from Boer sources, without reference to the life of Sir George Colley. The Jameson Raid in 1896 is shortly narrated, and a good account of the Boer military organisation, armaments and preparation for the late war, which, it is said, began immediately after this, is given. The British organisation, armament, and fighting method is then described. In regard to the latter, it is said that English modern tactics in 1899 resembled those of the Peninsular war and of the Crimea, more than the skirmishing order of the Franco-German war. Surely it is scarcely scientific to generalise in this way! A study of our drill books of 1896 should have prevented it. We should hesitate to aver, on account of the formation of the Prussian Guard at St. Privat in 1870, that the tactics of the German Army were then mediæval! The writers say that supply difficulties in recent wars had made British commanders heavy and slow in movement. Lord Roberts's march to Kandahar in 1880, Gatacre's dash to Dir in 1897, and the march of the Royal Irish across the desert, can scarcely be characterised as slow movements. The remark, however, that in 1899 public opinion measured the capacity of a general too much by the smallness of his casualty list, and that it had become the custom to describe slight losses as serious, is true. The clamour of the Press at the losses in the old Sikh war is still remembered. The German General Staff do well, therefore, to remind us that omelettes cannot be made without breaking eggs, and our officers should take comfort from their assertion that in modern war to be decisive, attacks have now, as before, to be driven home, and that then heavy losses must be expected. Stress is laid upon the insufficiency of our District Command System, and on the absence of the larger tactical units in peace, so necessary for united tactical action in war, as well as on the necessity for more frequent and varied manœuvres. It is to be hoped that our Army reformers may give their attention to these remarks, and that the permanent organisation of divisions as suited to the requirements of modern war, as well as to our peculiar service, may be maintained.

When the German authors go into detail as to the method of British infantry attack, as laid down in the Infantry Drill of 1899, they fall into several errors. They describe the 2nd line as intended to carry out the assault. This was altered before 1896, and the 2nd line was ordered to aid the 1st line in its assault if necessary, which is rather an important difference in principle. No order existed in 1899 to approach within 800 yards of the enemy before deploying, as stated by our critics; but all

preparations and formations for attack were ordered to be made out of fire; I.D., 1896, 124 (14). The firing line was also ordered to open fire when unable to advance without undue loss. The duties of the 3rd line were not as described by the authors, who may perhaps have taken their notes from our Infantry Drill Book of 1893, instead of that of 1896. This is only touched upon to show that our authorised methods were not quite so antiquated in 1899 as some wish to believe; and if all commanders had carried out in action the principles of the Infantry Drill Book of 1896, they would not have gone very far wrong.

The writers constantly remark upon the want of instruction in the "preparatory fire," which is so necessary in the modern fire-fight. Yet we find the term "preparatory fire" often recurring in that Drill Book.

The German criticism of our tendency to volley firing, lest our troops should waste their ammunition, is quite justified. It was overdone. Flank attacks were by no means ignored by our regulations (I.D., 1896 110). If frontal attacks were made by individual commanders without flank attacks as well, it is another matter. However, criticism on our regulations are always useful, and "Infantry Training" and "Combined Training," though somewhat long and wordy, are distinct improvements on previous work, and it is to be hoped that "Cavalry Drill" may soon be issued in an improved form.

On the whole, the German criticism may, however, be taken to mean that, notwithstanding their defects, our tactical books were fairly up to date, as they say they much resembled the German ones.

The preliminaries to the Boer war are well described, the Report of the Royal Commission having apparently been studied as to the information at the disposal of the Government at the outset. The instructive account of the rapid mobilisation in India and the early actions of Sir George White's forces is particularly well done, and the information obtained as to the plans of the Boers and the action of their forces makes it especially interesting. Sir George White's wish to concentrate his force at Ladysmith without holding Dundee is strongly upheld. Generals French and Hamilton receive high praise for the action at Elandslaagte, and Sir George White's endeavours to stem the torrent before being shut up in Ladysmith are briefly narrated. The unfortunate incident of the surrender at Nicholson's Nek is kept in its true proportion. The advance of the Boers in Natal, and the landing of Sir Redvers Buller's army corps, his perplexities and the measures he took to meet the emergency are very well epitomised. It is suggested that the relief of Kimberley might have been postponed, and the bulk of the troops concentrated in Natal.

The events leading to the BATTLE OF COLENSO, and especially the Boer positions, are well and carefully described. It is stated that Sir R. Buller intended crossing higher up at Potgieter's Drift, but that the news of Gatacre's failure at Stormberg and of Methuen's disaster at Magersfontein necessitated a prompt success in Natal, so Buller decided to force the passage of the Tugela at Colenso at once. Fort Wylie was heavily bombarded on the 14th. As the Boers did not reply, and as the mounted men did not reconnoitre more than six miles from their camp, the account says, Buller thought he had only a small rear guard to deal with, and that but little resistance would be offered him. His non-occupation of Hlangwane Hill as an observation post from the 11th to the 16th, and the neglect of the cavalry to obtain information (by dismounted action if necessary) is severely criticised. They believe Buller evidently thought the enemy were abandoning the position, and it was only necessary to advance rapidly in pursuit. But, the writers say, why did the general not inform

Sir George White, with whom he was in telephonic communication through Weener, of his new resolve to force the passage on the 15th, he having previously indicated to that general the 17th as the day of his intended advance. The account, which is accompanied by an excellent small-scale map, showing the country from Colenso to Acton Holmes, and also larger ones, gives all the well-known facts about the battle of Colenso and General Clery's orders for forcing the passage. It criticises the operations, and narrates Lord Dundonald's attempt on Hlangawane Hill; but, curiously enough, says but little as to General Barton's refusal to send even a battalion to Lord Dundonald's assistance, though asked for it, which seemed to many, in the face of the wording of para. 7 of the orders for forcing of the passage, one of the most remarkable incidents of the day. The writers lay all the blame on the Commander-in-Chief, who, they say, lost his self-confidence and power of reflection on becoming aware of the loss to the gun detachments of Colonel Long's two batteries, and was then no longer the leader but a fellow combatant, who made a series of futile endeavours to withdraw his guns. Orders to retreat were issued, but it was the general and not his gallant force that was "defeated." Space does not admit of our quoting the arguments, for which we refer our readers to the account itself; but this says, that if the general had held his ground, Hlangwane Hill could have been occupied in the afternoon, or the bridge at Colenso stormed at dusk or shortly before daybreak. It is a fair supposition that if a small force had held the ground on Buller's left, and Dundonald's mounted men, strengthened by 3 battalions of Barton's Brigade, that Hlangwane might have been carried in the afternoon, and, that done, the centre might have been forced, as the losses were by no means severe. General Hildyard is accorded praise for the tactical skill he showed in leading his brigade, and the surprise of Hart's brigade and of Long's batteries are spoken of as events which occur at the beginning of every campaign. As an instance, the writers allude to the well-known case of the artillery of the 9th Corps at Vernéville on the 18th August, 1870, which suffered great loss for want of sufficient reconnoitring. This was, however, a long time ago, and there is no reason why our officers should copy the mistakes made by their German brethren, though we may wish them to imitate their excellencies. The river is stated to have been on the 15th December, 1899, nowhere more than about 6 feet deep, with many shallows.

Lord Methuen's advance to the Modder River and the fight there meet with but little comment. It is considered that he should have pushed forward after the Boers at the Modder River, as they were much shaken; but that as Kimberley was not hard pressed he was perhaps justified in better securing his communications first. Lord Methuen's insufficient reconnoitring at MAGERSFONTEIN is severely handled. His deficiency in mounted troops is recognised, but they were not properly used. They should have dismounted and crept forward to reconnoitre. His useless bombardment betrayed his intended point of attack; and why was the infantry withdrawn on the afternoon of the 10th December? No infantry reconnoitring patrols seem to have been sent out at all any distance, or they would surely have discovered the Boers digging trenches at the foot of Magersfontein Hill. The account of the night attack is an impartial one, and clear, excepting that the terms "right" and "left" are here and there used indiscriminately. Great praise is given for the way in which, after the disaster to Wauchope's brigade and the serious check to the attack, attempts were made to rush the position; but now "the absence of unity of command and of all support enabled the Boers to repel with ease these isolated attacks." On the whole, it is a wonderfully good description of the modern fire-fight. Lord Methuen is blamed for want

of active energy in restoring the battle. "The divisional staff seemed to keep the idea of turning the tide of battle by a renewed attack carefully in the background," and this though only half the force had been brought into action. The Germans are constantly remarking on our reluctance to use our reserves. There is no doubt that tactical strength consists in at first keeping reserves in hand, but there is a time to let them go. Our officers should study the efficient use made by Napoleon of his reserves, to which much of his tactical success was due. Times and weapons have changed since then, and distances make this more difficult; but by close study, thought, and practice, difficulties may be overcome.

Lord Methuen is much blamed for letting the men go into action without proper food. His cavalry is taken to task for want of enterprise, and not acting against the flank and rear of the enemy. Which flank, is not mentioned. To attack their extreme right would have involved a ride round by Berg Farm, a distance of about 8 miles. Their left flank rested on the river. A cavalry dash between the right of the Highland Brigade and the left wing of the Boers might certainly have effected a diversion, relieving the sorely tried Highlanders, and giving time for a prompt and vigorous attack by the Guards. But the cavalry did not apparently know the country, and might have fallen into a trap as our cavalry did after Dundee. Still, it might have been worth the risk. The timely charge of the cavalry regiment at the battle of Vionville to extricate the 38th Brigade will be remembered.

General Colvile is considered to have displayed insufficient energy and initiative, while that of the officer commanding the Yorkshire Light Infantry is commended.

The general conclusion formed is that no decisive inferences can be drawn as to attack and defence in modern war from the circumstances of Magersfontein, which were peculiar. The attackers here advanced without much plan, without unity of direction, engaging piecemeal but a part of their forces, without depth, without reserves, without determination to be victorious at one point or the other; yet they attacked the strongest points of the position. The defenders had well utilised the long time accorded to them by skilfully entrenching a naturally strong position. Their artillery was, however, very inferior. On the whole, the difficulties of the attack against modern firearms seem greatly exaggerated.

The second volume (Heft 33) of the above deals with the events from the date of the appointment of Lord Roberts to the Chief Command in South Africa on the 18th December, 1899, to his triumphant entry into Bloemfontein on the 13th March, 1900. The situation on 10th January, 1900, when Lord Roberts and Lord Kitchener, of whom short character-sketches are given, arrived, is briefly explained, omitting all collateral issues, and a useful skeleton map is given to illustrate this and to show the chief lines of railway (omitting roads and detail), and the position of the different bodies of our forces. The premature abandonment of the important strategic point, Stormberg Junction, by Sir R. Buller, in November, 1899, is condemned as an unnecessary surrender, owing to which the valuable transverse line of communication with De Aar on the west was lost.

Lord Roberts's first task was to reorganise the transport train, so that the troops might be less dependent on the railways and not restricted as hitherto to operations not more than two or three days' march from these. Many thousands of oxen, mules, and carts had been collected by the end of December, 1899, in accordance with Sir R. Buller's arrangements, and these were now organised. The account goes into all the details of this organisation with the pros and cons of the regimental transport system,

which, being well known to our readers, we do not enlarge on. The Army Service Corps officers are given great credit for their exertions. Our space does not admit of recounting the methods by which the transport was replenished and supplies kept up, all of which is briefly but interestingly and correctly described. The formation of the Cavalry Division and of the new levies of mounted infantry is detailed. There was not time, the account says, to train these properly; but in the course of the campaign they became an efficient force, and did excellent service. The organisation of these and of the several Colonial regiments of horse is detailed. Roberts's Horse and Kitchener's Horse were not, it appears, as is sometimes supposed, formed entirely of Cape Colonists, but from men whom the war had attracted from all parts of the world. Nesbitt's Horse and others were raised in the Colony. The strength of all these corps varied, and the mounted infantry organisation was changed from time to time, according to the exigencies of the moment. This could not but have been trying to these valuable troops, of which it is to be hoped we soon shall have a body permanently organised, notwithstanding the strong preference shown by our German critics for cavalry pure and simple who are equally efficient on foot. We had good experience of cavalry acting as infantry in the Soudan, and, splendid soldiers as our cavalry are, we cannot afford to dispense with our mounted infantry, who did so well in South Africa, and are well worthy of higher training as most valuable troops in any part of the world. This does not mean that our cavalry should not also have good training in rifle practice. The General Staff account of the war discusses the lines of operation open to Lord Roberts for his advance on Bloemfontein, which it was determined should be the first objective. It was thought Colenso and Kimberley would be relieved by the occupation of the capital of the Orange Free State. For this the three lines of operation were:—(1.) Across the Tugela and through Ladysmith. (2.) Across the Orange River by Springfontein. (3.) Across the Modder and from Kimberley. The nature of the country and the probable effect on the Boers in operating by either line had to be considered. This latter, and the great difficulty of finding water for the large number of men and animals, unless he could advance up the line of the Modder, probably decided Lord Roberts to choose the Western line of advance. "In this," says the account, "he was justified by the reasons given, and by the event." The Natal line railway would probably have been destroyed, and, in any case, it terminated at Harrismith, nearly a month's march from Bloemfontein. The central route would have found the bridges and railway leading across the Orange River direct on Bloemfontein destroyed, necessitating a long delay in the advance, and allowing concentration of the enemy on the centre for its defence.

LORD ROBERTS'S ADVANCE ON BLOEMFONTEIN FROM THE WEST. — The writers criticise the taking away all the divisional cavalry from the fighting divisions of Lord Roberts's army to form General French's Cavalry Division. "It is more important than ever with the present long-range rifles that some cavalry, however few, should accompany every body of infantry to protect the latter from sudden surprise by fire at effective range."

A detailed account is given by the writers of the arrangements made by Lord Roberts for the march of the bulk of the force under him to Bloemfontein, which was to consist of the 6th Division (General Kelly-Kenny), the 7th Division (General Tucker), and a 9th Division (formed of Highlanders and some Line of Communication Battalions), under General Colvile. The Cavalry Division of three brigades, with a force of mounted infantry, was placed under General French. Another force of mounted

infantry, under Colonel Hannay, was collected, and the whole force was concentrated at Modder River Camp, where the 1st Division, under Lord Methuen, was to remain to guard the communications. The date of the march and destination of the various bodies were kept carefully secret. The force, which was strong in artillery, is detailed in the appendix to the account. The first start was made by General French on the 12th February, 1900, and the account follows, step by step, the movements of each body of troops. The careless way in which the cavalry reconnoitred is strongly commented on, as well as their losing touch of the Boers shortly after coming up with them—a want of perseverance which led to the disaster to the convoy at Waterval by De Wet on the 15th February. The account states that the reiterated complaint of the condition of the horses was a little overdone, and that more could have been effected with them had they been carefully looked after. As Lord Roberts found it necessary to draw attention to this point in a special memorandum, we cannot find fault with our critics for drawing attention to it, for nothing is of greater importance on a campaign than this matter of horsemastership. In regard to the loss of the convoy on the 15th, the authors ridicule the idea of a general officer commanding a whole division sending to Army Head-quarters to ask how many men he was to send as escort to a convoy, and Head-quarters were certainly to blame for entering into such a detail, and prescribing the number to be used. If the G.O.C. had taken proper measures to secure the march of the train, and the escort had been alert and properly disposed, the disaster would not have happened. The best security would have been to have made the convoy march on the left bank of the Riet River. Then the 9th Division troops marching on the right bank would have protected it, had the train marched on the evening of the 14th. Anyhow, De Wet concealed his 400 Boers effectually, and surprised the convoy while grazing a little before 9 a.m. Colonel Ridley sent a message to Head-quarters for assistance, and the 14th Brigade was ordered to march back from Wegdrai to his assistance. The report says these troops arrived piecemeal, and exhausted by the heat, General Tucker, with the last of them, only arriving late in the afternoon, by which time the commander of the escort, Colonel Ridley, had relinquished the convoy. Whether from the exhaustion of the troops or from fear of not catching up the main body, which he had orders to rejoin as quickly as possible, General Tucker made no attempt to recover possession of the convoy. It is a strange story altogether, as Wegdrai is only about 9 miles from the Waterval Drift; but it shows how fatally the want of mounted troops makes itself felt. Colonel Ridley had only about 150 mounted infantry, with two companies of infantry. The consequences of the loss of this convoy were serious to the force; but the writers give praise to Lord Roberts for his steadfastness in pursuing his course towards his main object, and disregarding collateral issues, and for his prompt measures to meet the loss, while the conduct of officers and men under the privations entailed was most soldierlike.

On the same day—the 15th February—General French, who was far ahead, made his celebrated dash through the Boer line, and so got through to the relief of Kimberley. This brilliantly conceived and executed stroke is graphically described by the authors, who speak in its unqualified praise. They also draw deductions therefrom as to the future possibilities of cavalry action against infantry. But this was a rapid dash across a space between widely separated infantry parties in scattered order, not an attack on infantry as they call it. Colonel Hannay, who, with his mounted infantry, headed the 6th Division sent in support of General

French, is blamed for not properly reconnoitring beyond the Modder, owing to which Cronje was enabled to escape from his critical position at Magersfontein.

THE PURSUIT OF CRONJE, AND PAARDEBERG.—A cavalry squadron at Abomdam, left behind on General French's rapid advance to Kimberley appears to have seen Cronje's preparations for moving off Eastwards, but did not report it to General Kelly-Kenny, the nearest Divisional General. Lord Kitchener had been directed by Lord Roberts (who was on the 16th and 17th sick at Jacobsdal) to assume the direction of the pursuit. Early astir to reconnoitre personally, he saw clouds of dust arising and moving Eastward, and recognising the importance of this at once gave orders to General Kelly-Kenny for energetic action to intercept Cronje's force on its march, and sent to General French at Kimberley to the same purport. Unfortunately the latter had pursued some detachments of Boers some distance Northward beyond Kimberley, so it was some little time before his greyhounds (as far at least as thinness went the simile may hold good) could double back on their hare. It would take too long to repeat the well-known story, which is clearly and well described in this excellent narrative; but the heading of French's squadrons at Kameelfontein and the rapid closing up of Kelly-Kenny's 6th Division led to bringing Cronje completely at bay at Paardeberg. The fighting here on the 18th February, 1900, is very carefully detailed and severely criticised by the German Staff account. At the same time, it says it was not the act of Lord Kitchener in attacking it disapproves of, but the manner of it, especially the piecemeal way in which the troops were thrown into the fight.

The sudden appearance like magic of De Wet in the rear of the troops attacking Cronje from the South, owing to the casual way in which Kitchener's Horse had apparently all gone off to water their horses at some little distance from their post at Osfontein, is well pictured. The necessity for providing British soldiers with a plentiful supply of drinking water is insisted on, for they suffered cruelly during these long hours of attack. The water supply question is all-important, and is now being carefully considered, and experiments are constantly made. If officers would, however, by their own personal example discourage the constant drinking of water by their men, which always makes them crave for more, and get them to fill their water bottles with cold weak tea on getting up in the morning, and to sip small quantities at a time, it would be a valuable aid. The account says the Boers always had plenty of water. When you remain more or less in one place on the defensive it is comparatively easy.

General Colvile's neglect to support the gallant Cornwalls and Canadians in their attack at Paardeberg is severely criticised, and so is Lord Kitchener's ill-timed advance of Colonel Hannay's weak body of mounted infantry, where the latter lost his life. This attack and that of the Essex and Welsh is said to have failed owing to the diversion of two battalions and a field battery to check De Wet's onslaught. In regard to Lord Kitchener's conduct of the attack on the 18th, we notice that the translator inserts a foot-note to his page 191 in regard to his personal bearing and taking the command of brigades, battalions, etc., out of the hands of their leaders. He may have done so, but we cannot find any note of it in the German text. Colonel Waters' book is said to be a translation. If he interpolates a remark of his own it should, we think, be so distinguished. The way in which the 13th Brigade was commanded when attacked by the numerically inferior Boers comes in for much unfavourable comment: no unity of direction, no attention to fire tactics; each battalion

and battery acting independently. The Boers attacked in long lines of skirmishers, opening fire at 1,500 yards. This it will be found on close enquiry they generally did. The waiting till their adversaries were quite close before firing was only done in isolated cases in small actions, for they thoroughly understood the use of long-range fire. They had little depth and no reserves. Notwithstanding the greater extension, depth in the formations is required to replace the losses incurred in front, as a given force cannot after all occupy a much wider front than before. The ranges will be longer than heretofore, but the South African atmosphere is peculiar. In European war this will have to be discounted. These and other thoughtful remarks on the tactics of to-day are scattered through these chapters on Paardeberg, and are well worth the consideration of our officers. The British gallantry in attack is highly praised. They dashed forward to within 500 yards, and threw themselves down. Here they should have opened an overwhelming fire, which at that range would often have forced the enemy to retire; but no, they must rush on to 300 yards without firing. In this they suffered much loss, and their fire thence was ineffectual. This may be because the men were more flurried; but the same seems to have been the case with the Boers, for they often fired badly at close range. There can be little doubt if a halt is to be made to pour in an overwhelming concentrated fire, that it should be delivered at beyond 500 yards from the position. The writers say that in most battles a decision will not be arrived at on the first day, but that the attackers must intrench during the night and await the dawn, when the side most exhausted will give way. Their remarks advocating crawling forward in the last stage are worth study. They think our men ought to have held on to their positions on the first day at Paardeberg, exhausted as they were. "Lord Kitchener's attack was, however, too hastily planned. If the divisions had all been brought up on the night of the 18th February, a powerful concentrated, simultaneous attack might have been delivered on the 19th. Instead of this three isolated, unconnected attacks were made. Foiled by Cronje's stubborn resistance, he throws in the battalions singly into action, and sacrifices Colonel Hannay's gallant band of mounted infantry." This is all attributed to Lord Kitchener's want of experience in the tactical handling of large bodies of troops in action under present conditions. But they consider that Lord Kitchener wished to hurry the attack because Cronje was so quickly entrenching.

In the general criticism of the operations of the Paardeberg campaign the writers consider Lord Roberts should have annihilated Cronje first, before relieving Kimberley, which would then have followed automatically. They criticise Lord Roberts's constant practice of turning the enemy's flank, and fear of the direct offensive. It may be considered perhaps that they wish to inculcate the maintenance of the offensive spirit in the German Army. Judging from a purely military point of view, Lord Roberts should have annihilated the Boers. What instructions Lord Roberts had we know not, but his character for humanity is well known. He considered, no doubt, that this was not a war of extermination. These brave Boers whom we were fighting to-day were to be our fellow-subjects to-morrow, and to work with us for the Empire. Was it desirable, then, to carry on war so that few of them would remain to populate the country if victory could be gained in any other way? During the operations which led to Cronje's surrender, Sir Redvers had been fighting a series of important actions for the relief of Ladysmith at Spion Kop, Vaal Kranz, and Pieter's Hill, of which no account is given, probably because the chief contributor was not personally present with this force, not because useful

lessons may not be drawn from the fighting. It is merely remarked that the immediate effect of Cronje's capitulation was the raising of the siege of Ladysmith, and the withdrawal of the Boers from the northern parts of Cape Colony. General Gatacre reoccupied Stormberg Junction, thus restoring direct communication with De Aar, and a general forward movement across the Orange River was made.

Poplar Grove.—Lord Roberts allowed the troops a week's rest after Paardeberg, and reorganised his mounted infantry, and arranged for supplies for the further advance on Bloemfontein (about 70 miles from Paardeberg). The Staff had information that the Boers had collected again about Poplar Grove from 14,000 to 15,000 men. Lord Roberts reconnoitred on the 5th March personally, and found they had taken up a position to bar his advance, about nine miles long, extending from Leeuw Kop north to about Seven Hills Mountain on the South. They were not more than half as numerous as estimated. Lord Roberts made most careful arrangements for surrounding the enemy, and gave each portion of his force directions as to the part it was to play in the game, in order to cut the Boers off from Bloemfontein, and drive them back on the Modder and there capture them. But the horses of the cavalry, on which so much depended, were still in wretched condition, and the ground was soft. It was, however, owing to the unfortunate way in which Lord Roberts's orders were executed that his intentions were not accomplished. The cavalry should have been in rear of the Boer position by daybreak to ensure success. They should have started overnight, then rested, and could then have been in position at Poplar Grove Drift to intercept their flight. The infantry should have been engaged in a steady attack to hold the Boers while the cavalry got round them. The writers see in all this the fatal desire on the part of the Commander-in-Chief to avoid frontal attack at all costs, which caused the other leaders to act with such indecision, that the result was the Boers, getting wind of the scheme, got clean away without any loss to speak of. The writers show in detail how it came about that Poplar Grove was a lost opportunity.

The Action of Driefontein, *10th March, 1900*.—This is one of the most interesting chapters in the German Staff account, and it is to be regretted that the authorised English translation should not have included this and Poplar Grove for the benefit of the general public, though most of our officers will doubtless read it in the original. It is possible, too, that it may be intended to continue the English translation from Paardeberg onwards up to Pretoria, if the General Staff should continue the account. It must be remembered, though, that they do not promise us a continuous account—only certain phases of the war of especial military interest.

Driefontein was remarkable for the prompt decision shown by General Kelly-Kenny, the writers say, who fought the action almost single-handed with his division. General French was to have had command of all the troops that day, and the cavalry were to make a wide turning movement. Lord Roberts thought from the information gathered that only a rear-guard action would be fought on that day. Lord Roberts marched on 10th March from Poplar Grove towards Bloemfontein. It was expected that the Boers would once more gather to cover that town, though they had fled so incontinently at Poplar Grove. The force was therefore divided into three columns, of which Lord Roberts commanded the centre column himself. On the evening of the 9th, information was brought to his camp that the Boers were holding a strongly entrenched position near Abraham's Kraal. He decided to turn it by a wide movement southward. The left column, consisting of the 1st Cavalry Brigade, Alderson's Mounted

Infantry, and the 6th Infantry Division, General Kelly-Kenny in command, had started at 6 a.m. on the 10th, the mounted troops being an hour or so ahead.

The Boers had taken position in three groups on the kopjes about Abraham's Kraal under De la Rey, Philip Botha, and Christian De Wet. They numbered about 6,000 men and 16 guns. Brigadier-General Porter pushed forward with the 1st Cavalry Brigade and Mounted Infantry, and the turning movement ordered by General French was already in progress, so General Kelly-Kenny determined to hold the enemy by a strong frontal attack to give time for this to develop, Brigadier-General Broadwood, commanding the 2nd Cavalry Brigade, having joined in the movement. This force drove the Boers back from the Böschrand Kopjes, but did not press them. Seeing the cavalry did not advance, General Kelly-Kenny decided on a vigorous flank attack also. His attack was well arranged and well carried out. The Boers were driven from their strong positions with considerable loss. The writers describe Driefontein as a success in every way. It was a good example of modern tactical skill. There was sufficient depth in the dispositions, reserves were kept back till wanted, only sufficient troops were extended to effect their purpose, and there was united action throughout; the ground was carefully utilised, and frontal and flank fire was well combined. The co-operation with the artillery was well arranged and most effective, the infantry came into action simultaneously with the artillery, who seemed to have omitted the hitherto indispensable artillery duel, and the guns supported well the close infantry attack. In short, Driefontein was the only action since Elandslaagte, where the all-importance of fire-action seems to have been properly recognised as the only decisive factor in modern war. Noteworthy was the way in which the infantry was led forward in the close attack as a united body, and not piecemeal, the artillery supporting them by their fire till the last possible moment. This decided the action. The Boers could no longer stand to fight. At Driefontein the united fire-action, and the increasing intensity of this fire with every step of the advance until the enemy was so thoroughly shaken that he could be driven from his position by a powerful assault, won the victory. The greatest credit is due to General Kelly-Kenny for his assumption of the responsibility of making such an attack in face of the orders against any frontal atacks. Driefontein will always be a day of glory for the gallant 6th Division and its bold leader.

The above is only a very brief summary of some of the points touched on. A good, clear sketch map and a very graphic account of every movement made in this brilliant action is given by the writers, with full tactical criticism, which is sensible and useful. The writers take this opportunity of singing the praises of the German tactical regulations, the principles of which, they say, have been proved to be sound, and equal to the requirements of modern weapons, though they may require some modification in form. "Distances have considerably increased." It is questionable if close order formations can be maintained in any part of the battlefield which is exposed to hostile fire. The arrangement of the lines of skirmishers for the attack and their movements may have to be modified in accordance with the enemy's fire, without the loss, by splitting up units and sub-units too much, of the great power that united and decisive action gives. This does not touch the essence of the matter. The attack will not fail in future, notwithstanding the effect of smokeless powder. if the proper spirit of the principles laid down for its execution is seized and understood.

"Our Army has in the leading ideas dominating our tactical regulations an asset, the value of which the experience of the South African war

has in nowise diminished, however well worth our attention these may be in other respects." The above may be looked upon as a reply to those many critics of the German Army who are clamouring for a new Infantry Field Exercise, or, as we now call it, Infantry and Combined Training. We shall look forward with great interest to the succeeding volumes of this interesting publication, and in the meantime commend the study of these first two as containing many valuable tactical deductions.

The translator seems, on the whole, to have done his work well. It is difficult to make readable English out of German, and yet he has succeeded in doing this. In some parts the original is, however, too freely rendered—e.g., *spielend überwindet* is rendered "thinks nothing of" instead of "easily overcomes." It is not quite the same thing. "*Umsichtig*" is always rendered "cautious" where "prudent" would seem to be intended. Fighting method is often translated "formation," not quite the same thing to a tactician. The description of the country writen by Major Count Götzen might have been less literal. "The climate is also something quite unusual for the European" is not exactly English; "the rainy season falls in it," instead of "during which the rainy season occurs." These are trifling matters but jar slightly. On p. 37 "*Im Shritt*" is rendered "at a foot's pace." Why not "in quick time," which is the military equivalent, and understood by civilians also. In the Magersfontein night attack "distance" is rendered "interval." The "investment" of Cronje is spoken of. As this is a technical word with a technical meaning, would not simply "surrounding" be better?

PRINCIPAL ADDITIONS TO LIBRARY DURING APRIL, 1904.

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The Book of Dignities. By HAYDN. New Edition by HORACE OCKERBY. 8vo. 25s. (W. H. Allen & Co.) London, 1890.

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A History of the Lancashire Fusiliers, formerly XXth Regiment. 2 vols. By Major B. Smyth, M.V.O. 8vo. (Presented.) (The Sackville Press.) Dublin, 1903-4.

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79. *Changes in Field Artillery Equipment and their Effect on the Action of Artillery in the Attack.* By Brevet Lieut.-Colonel A. H. Gordon, R.A., D.A.Q.M.G., Ist Army Corps. Aldershot Military Society. London, 1904.

The Riddle of the Sands. By Erskine Childers. Crown 8vo. (Smith, Elder & Co.) London, 1903.

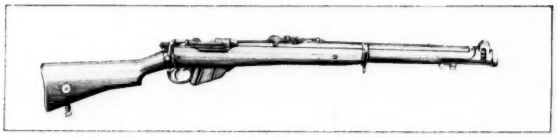
Die Oesterreichische Armee 1700-1867 By R. von Ottenfeld and Oscar Teubner. Demy folio. (Emil Borté et Cie., and S. Czeiger.) Vienna, 1895-1903.

Hints on Military Mapping. By Captain C. B. Simonds. Demy, 12mo. 1s. (Presented.) (William Clowes & Co., Ltd.) London, 1904.

The Fight for Canada. By W. Wood. 8vo. 21s. (Presented.) (Archibald Constable & Co., Ltd.) London, 1904.

Regulations for Mobilization. (Provisional.) Official. Crown 8vo. (Harrison & Sons.) London, 1904.

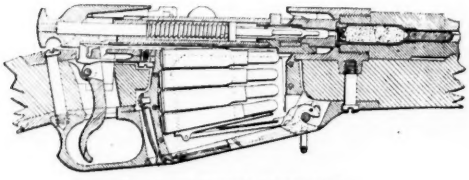
Views of Backsight.



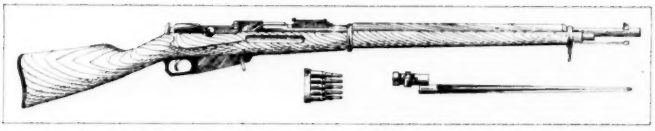
Rifle, Short, Magazine, Lee-Enfield Mark I.

Length of rifle with bayonet, 4 ft. $8\frac{1}{16}$ inch; weight, 8 lbs. $2\frac{1}{2}$ oz.; calibre, ·303 inch; mean muzzle velocity, 2,025 foot-seconds; sighted up to 2,000 yards, with dial sight ranging from 1,600 to 2,800 yards; weight of cartridge, 415 grains.

THE NEW ENGLISH ARMY RIFLE. (*See* page 698.)

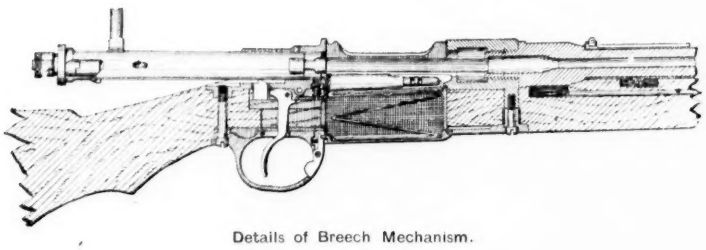


Details of Breech Mechanism.



Length of gun with bayonet, 5·7 feet; weight, 9·5 lbs.; calibre, 0·27 inch; initial velocity per second, 2,035 feet; sighted to 1,600 yards; weight of cartridge, 380 grains.

THE RUSSIAN ARMY RIFLE. (*See* page 741, Military Notes.)



Details of Breech Mechanism.

Length of gun with bayonet, 5·4 feet; weight, 9·6 lbs.; calibre, 0·25 inch; initial velocity, 2,578 feet; sighted to 2,000 yards; weight of cartridge, 336 grains.

THE JAPANESE ARMY RIFLE. (*See* page 735, Military Notes.)

J. J. K. & Co., Ltd., London.